



M18 HELLCAT **VS** PANTHER

Arracourt 1944



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CONTENTS

Introduction	4
Chronology	8
Design and Development	10
Technical Specifications	26
The Strategic Situation	37
The Combatants	42
Combat	55
Statistics and Analysis	70
Aftermath	73
Bibliography	78
Index	80

INTRODUCTION

In September 1944, Allied forces were closing in on the borders of the Reich after inflicting massive damage on German forces in the battle for Normandy. Racing eastward with the mechanized columns of Lieutenant General George S. Patton's Third US Army were three battalions equipped with the M18 76mm GMC, a specialized tank destroyer with light armor, a 76.2mm main gun, and able to reach speeds of up to 55mph, making it the fastest tracked armored fighting vehicle of World War II. Although German forces in France were shattered, newly formed Panzer brigades were moving to defend the approaches to the homeland, each with a full battalion of newly produced Panther tanks. Arguably the best medium-tank

An M18 passing the burning German town of Irsch, February 27, 1945. Although designed primarily to engage enemy tanks, the M18 and all other US tank destroyers spent much more time supporting US infantry operations or joining divisional artillery in providing indirect-fire support. [Signal Corps Archive/Wikimedia/Public Domain]





design of the war, the Panther, with its long, high-velocity tank-killing 7.5cm gun and thick, sloped frontal armor, technically outmatched any British or US armored fighting vehicle.

Lieutenant General Patton's Third US Army had made the most rapid advance across France, and in September was the closest Allied force to the German border, poised to dash through the Lorraine region in northeastern France and cross the Rhine River. Hitler and his high command considered Patton's forces the most immediate threat and shifted the 5. Panzerarmee south to Lorraine to strike his spearheads. Six of Hitler's new Panzer brigades, many led by aggressive armored leaders drawn from the Eastern Front, were ordered to lead the attack. The offensive was met by the Third US Army's 4th Armored Division, with three battalions of M4 medium tanks and its attached battalion of M18 Hellcats. The resulting series of armored clashes around the town of Arracourt would be the largest tank-vs-tank engagement between US and German forces in the European Theater of Operations (ETO) to date.

A Panther (foreground) is accompanied by a Tiger I. The Panther's *Schürzen* side armor is clearly visible. Portions of the *Schürzen*, added to help protect the tracks and road wheels from Soviet 14.5mm antitank rifles, were often damaged or lost as the tanks maneuvered in the field. (ullstein bild/ullstein bild via Getty Images)



A Panther passing through a village in Italy, summer 1944. Panthers were present during the Italian campaign, but engagements with US forces were rare due to limited numbers and the unfavorable terrain for armored actions. As a result, US forces regarded the Panther threat as similar to that posed by the Tiger I and expected to encounter only small numbers of Panthers in France. (ullstein bild/ ullstein bild via Getty Images)

The Panther and M18 Hellcat reflected radically different design priorities. The Panther was developed to be Germany's answer to the superb Soviet T-34 medium tank first encountered during Operation *Barbarossa*. The 20-ton-class PzKpfw III and IV medium tanks were the Wehrmacht's heaviest tanks when its Panzer divisions won their early victories. Lightly armored and armed, but manned by highly experienced crews, they had defeated the heavier British and French tanks encountered in 1940 through the use of superior tactics. Operation *Barbarossa*, however, brought the Panzers into contact with the T-34 and its excellent balance of firepower, armor, and mobility, forcing a crash program to develop a new, superior German design. The resulting PzKpfw V Panther medium tank featured superb firepower and frontal armor, although its cost limited numbers produced, and reliability problems dogged its reputation and use throughout World War II.

At Arracourt, Panthers would repeatedly go head-to-head with M18 Hellcat tank destroyers attached to the US 4th Armored Division. The design of the M18 – formally the M18 76mm Gun Motor Carriage (GMC) – was radically different from that of the Panther. After the fall of France in 1940 the US Army decided to field a force of highly mobile tank destroyers to encircle, engage, and destroy any Panzer divisions that broke through its infantry lines. The first tank-destroyer battalions entered battle in 1942 and 1943 equipped with improvised designs, but by 1944 the M18, designed in accordance with the US Tank Destroyer Center's doctrinal requirements, was ready to enter battle. The M18 was the fastest tracked vehicle of



World War II but carried minimal armor, and by the time it entered combat, its 76.2mm main gun was almost useless against the frontal armor on the Panther. On paper, any contest between M18s and Panthers appeared to be a David-and-Goliath affair, with fast but poorly armored M18s equipped with an inferior main gun facing German tanks with superior firepower and frontal armor. Despite the Panther's technical superiority, however, after six days of battle the M18s of the 704th Tank Destroyer Battalion emerged victorious in a series of close-range engagements, claiming 37 German tanks destroyed for the loss of four M18s. The 4th Armored Division, with its experienced and well-trained crews and superb air and artillery support, had destroyed Hitler's hastily formed Panzer brigades.

Saint-Malo, August 8, 1944: an M18 supporting troops of the 83d Infantry Division during the fighting in Brittany. Three M18 battalions – the 603d, 704th, and 705th – initially deployed to France in August, all with Patton's Third US Army. (Robert Capa/Pool/Keystone/Hulton Archive/Getty Images)

CHRONOLOGY

1940

June

Stunned by France's rapid collapse, the US Army investigates methods to defeat German Panzer breakthroughs.

1941

April

The US Army decides to use mobile antitank guns, later redesignated tank destroyers, in units held in reserve at corps and army level to destroy future Panzer breakthroughs.

June

German forces are shocked to encounter T-34 tanks with excellent firepower, armor, and mobility during the early days of Operation *Barbarossa*, although superior German training and tactics allow the Panzer divisions to prevail.

November

The Panther Commission, composed of manufacturers, designers, and Army officials, visits 2. Panzerarmee commander Generaloberst Heinz Guderian at the front to investigate how to defeat the T-34. The Heereswaffenamt (Army Ordnance Office) issues a requirement for a new medium tank in the 30-ton range.

November

The US Army forms the Tank Destroyer Tactical and Firing Center, later the Tank Destroyer Command, to develop doctrine and field new vehicles to defeat the Panzer threat. The US Army at first fields improvised tank destroyers, but begins to pursue the design of a purpose-built, fast, lightly armored tank destroyer, ultimately leading to the M18 76mm GMC.

December

Daimler-Benz and Maschinenfabrik Augsburg-Nürnberg (MAN) develop competing prototypes for the new German medium tank.

1942

May

Hitler approves the MAN prototype, although he orders the frontal armor on the new tank increased from 60mm to 80mm. Testing of Panther prototypes reveals that the increase in armor and overall weight have increased the strain on the drivetrain and transmission, along with a variety of other reliability problems.

November

Despite teething and reliability problems, the Panther Ausf D is ordered into production so it can be used for the German summer offensive on the Eastern Front.

November

The first US tank-destroyer battalions, equipped with improvised truck-mounted 37mm and halftrack-mounted 75mm guns, land in North Africa during Operation *Torch*. The M10, mounting a 3in gun in an open turret on an M4 tank chassis, soon becomes the standard US tank destroyer, but the Tank Destroyer Center continues to pursue development of a purpose-built vehicle with the desired high speed. After evaluating several potential designs including the T42 and T49, the Tank Destroyer Center directs that the 75mm gun on the T67 be replaced with the new lightweight 76.2mm M1.

1943

- January** T67 trials lead to the project being closed. Buick is authorized to pursue the modified T70, and deliver six prototypes for testing.
- March** US troops equipped with M3 and M10 tank destroyers engage German armor at El Guettar, claiming to have destroyed 30 enemy tanks but losing 27 tank destroyers in the process.
- April** The first T70s are completed and begin testing in June.
- July 5** 200 Panther Ausf Ds make their combat debut during Operation *Zitadelle*, but many break down.
- July** Lieutenant General Lesley J. McNair, head of US Army Ground Forces, insists that T70 production begin so it will be available for the invasion of France in 1944, even though testing of the design has only just begun.
- August** Production of Panther Ausf A, with an improved turret, begins.

1944

- February 17** The United States approves the T70 tank destroyer design as the M18 76mm GMC. Buick's publicity department dubs the M18 the "Hellcat," although this never becomes an official US Army designation.
- March** Production of Panther Ausf G begins; about half of the total Panther production of almost 6,000 tanks will be Ausf Gs.
- May** Five M18s are sent to the Anzio beachhead, Italy, for battlefield testing. Three M18-equipped tank-destroyer battalions are in Britain and will deploy with Patton's Third US Army when it is activated.
- July** The first new Panzer brigades begin to form, each with a full battalion of newly produced Panther tanks.
- August** Patton's Third US Army advances into Brittany and then dashes across the

Seine River toward the German frontier. The 4th Armored Division, with its attached M18-equipped 704th Tank Destroyer Battalion, leads Patton's advance.

- September 3** Hitler issues his first orders for an offensive in the Vosges region of northeastern France to check the Third US Army using six of the new Panzer brigades.

- September 8** Panzer-Brigade 106 attacks Patton's northern flank, but loses 15–19 of its 22 operational Panthers fighting the US 90th Infantry Division at Mairy.

- September 12–13** Panzer-Brigade 112 attacks Patton's southern flank but is destroyed at Dompaire by the French 2^e Division blindée. Two of the Panzer brigades allocated to the offensive are diverted, leaving Panzer-Brigaden 111 and 113 for the Vosges Offensive.

- September 18** Panzer-Brigade 111 attacks toward Lunéville to cut off the US 4th Armored Division from the Moselle River but is repulsed by CCR. A platoon of the 704th Tank Destroyer Battalion accounts for five Panther tanks during the action without suffering loss.

- September 19–20** Panzer-Brigaden 111 and 113 attack major elements of the 4th Armored Division in the Arracourt area. US M4s and M18s inflict heavy losses on the attackers, with the M18s claiming 13–14 PzKpfw IVs and eight Panthers destroyed at a cost of three M18s.

- September 22** M18s of the 704th Tank Destroyer Battalion knock out an additional three German tanks.

- October** M18 production ends with 2,507 having been produced.

1945

- November 10** The Tank Destroyer Center is closed.

DESIGN AND DEVELOPMENT

PANTHER

The Panther was the centerpiece of Germany's mid-war effort to restore its Panzer supremacy. Since 1938, the Heereswaffenamt had been considering a replacement for the PzKpfw III and IV medium tanks, but the shock of encountering the Soviet Union's KV-1s and T-34s in the first days of Operation *Barbarossa* galvanized the effort. The Wehrmacht's standard 3.7cm antitank gun was ineffective against the armor of the new Soviet tanks, and while the PzKpfw IIIs and IVs had to close to almost point-blank range to engage them effectively the main gun on both the KV-1 and T-34 could knock out the German tanks at 1,000yd or more. The KV-1 heavy tank carried the excellent 76.2mm ZiS-5 L/32 main gun and heavy armor but had issues with mobility due to its 50-ton weight. The 29-ton T-34 medium tank, however, outclassed any other tank in the world in terms of firepower, protection, and mobility with its 76.2mm F-34 L/42.5 main gun, sloped armor, powerful diesel engine, Christie suspension, and wide tracks. Generaloberst Heinz Guderian, Germany's premier Panzer commander, called for an investigation after the 4. Panzer-Division under his command was battered by a T-34-led counterattack at Mtsensk on October 6. A commission of senior staff officers from the Heereswaffenamt, leading tank designers, and manufacturers was sent to the front to investigate, where Guderian suggested Germany produce a direct copy of the T-34. Soon known as the Panther Commission, the investigative group rejected this approach, noting the lack of steel alloy and diesel

engines that would be needed to manufacture such copies. Rather, the Panther Commission recommended up-gunning the PzKpfw IV as a short-term measure while pursuing a new, superior medium-tank design.

The Panther Commission report identified several aspects of the T-34 for consideration for the new German design. The 10ft 6in (3.2m) barrel length of the T-34's main gun gave it increased muzzle velocity and penetrating power; German prewar designs had not favored long tank guns that would overhang the front of the hull and cause problems when maneuvering on sloping terrain. The T-34's sloped armor increased the chance that enemy rounds would ricochet off rather than penetrating, while the angle gave increased armor thickness in the horizontal plane without the increase in weight of thicker armor. The T-34's powerful diesel engine, large road wheels, and wide tracks gave it excellent mobility. The Wehrmacht directed that its answer to the T-34, provisionally designated VK30.02, be in the 30-ton class, have 60mm of frontal armor, and mount a long, high-velocity 7.5cm main gun. The new design would use a Rheinmetall turret already in development to carry the 7.5cm gun. As Krupp was already pursuing the design of a new heavy tank that would ultimately become the Tiger I, the Heereswaffenamt turned to two other firms in November 1941, Daimler-Benz and Maschinenfabrik Augsburg-Nürnberg (MAN), to develop candidate designs.

Daimler-Benz completed three VK30.02(DB) prototype vehicles for testing in early 1942, moving away from many German tank design norms and embracing many features of the T-34. The VK30.02(DB) resembled the T-34 in appearance, weighed 35 tons, and had 60mm of sloped armor. The turret was mounted forward, and the long main gun overhung the front hull. Like the T-34, the Daimler-Benz design had a diesel engine and rear drive but retained a German-style leaf-spring suspension and

A Panther Ausf G, the final Panther variant, in late 1944. The rush to produce Panthers in time for the summer 1943 offensive led to the tank being fielded with a large number of unresolved reliability problems. [Photo 12/Universal Images Group via Getty Images]



Panthers being assembled at the MAN Nürnberg factory. The *Panzerwaffe* had planned to equip its divisions entirely with Panthers, but production issues and expense led to a decision to keep the up-gunned PzKpfw IV in service, and full-strength Panzer divisions fielded both a Panther battalion and a PzKpfw IV battalion. [Photo12/Universal Images Group via Getty Images]



small road wheels rather than the T-34's Christie suspension and large road wheels. As a result, the VK30.02(DB) had narrower tracks and an unimpressive ground pressure. Road range was 121 miles on one tank of fuel.

The VK30.02(MAN) prototype, like the Daimler-Benz offering, carried the 7.5cm gun and featured 60mm of sloped frontal armor, but in other ways had more in common with previous German tank designs. The turret was positioned in the center of the tank hull, thus reducing the overhang of the long 7.5cm gun and the MAN design retained the front drive and gasoline engine of previous Wehrmacht tanks. The VK30.02(MAN) was powered by a 600hp Maybach HL 210 liquid-cooled gasoline engine, had a 125-mile range, and was fitted with a new torsion-bar suspension system with eight large road wheels and a sophisticated internal twin torsion-bar system. Wide tracks gave a ground pressure of 12.5psi.

Hitler, always closely involved with armament issues and tank development, favored the Daimler-Benz design, but officials in the Heereswaffenamt argued for the MAN offering. Army officials asserted that the VK30.02(DB) design too closely resembled the T-34 and would cause "friendly fire" incidents at the front, while the long overhang of the main gun would cause problems when traversing slopes. Minister of Armaments and War Production Albert Speer's deputy Karl-Otto Saur, a former MAN employee, pushed strongly for the VK30.02(MAN) design, arguing that the need to develop and produce a new diesel engine would severely delay the fielding of the Daimler-Benz design. Hitler was persuaded to authorize the MAN version for production on May 15, 1942, but, concerned about future increases in enemy firepower, insisted that the frontal armor be increased from 60mm to 80mm. The new tank was now designated the Panzerkampfwagen V Panther Ausführung (Model) A (Sdkfz 171), with the name inspired by the original Panther Commission of 1941.

The Panther Ausf D

Unlike the practice in other major tank-producing countries, German tanks had chassis and turrets manufactured by different firms, and MAN's Panther would carry a turret designed and produced by Rheinmetall. MAN produced two prototypes to evaluate for production, a V1 with the chassis alone and a V2 complete tank with turret. The increase in armor ordered by Hitler resulted in a tank in the mid-40-ton rather than the 30-ton range, placing a greater strain on the engine and drivetrain. The Maybach HL 210 engine now only delivered a power-to-weight ratio of 13.97hp/ton, 15 percent less than the T-34 and 25 percent less than the original MAN prototype. Furthermore, the increased weight now imposed excessive strain on the Panther's road wheels, engine, gearbox, and transmission. Prototype testing identified many problems due to the Panther's hasty design process including fuel-pump failures and transmission breakdowns. As MAN had promised a tank with amphibious capabilities, the first Panthers had the engine enclosed in a rubber-lined compartment, leading to overheating and fires.

The normal development process would have seen these problems addressed with the fielding and testing of additional prototypes, but Hitler directed that 250 Panthers be ready for the upcoming German summer 1943 offensive against the Soviet Kursk salient, forcing the new tank to be rushed to the Eastern Front. As a result, the new Panther, designated Ausf D, was ordered into production in November 1942 before many of the teething troubles had been adequately dealt with. The first production

Germans testing a captured US M4 medium tank, with a Panther Ausf D at right. Although Panthers and Tigers were superior to US M4s and M18s in terms of firepower and protection, their high manufacturing cost limited the numbers produced and reliability problems plagued field operations. (Hanns Hubmann/ullstein bild via Getty Images)





A Panther Ausf D advancing with a German column on the Eastern Front, July 1943. Hitler's intense focus on deploying the Panther to the front for Operation *Zitadelle* in July led to a rushed testing program, and fielding of a tank with major mechanical reliability problems. [ullstein bild/ullstein bild via Getty Images]

vehicles were delivered to the Army in January and February 1943. Mechanical issues continued to plague the newly produced Panthers as units began training with them, and the first 250 Panthers had to be returned to the factory for post-production modifications. On June 16, Guderian, now Inspector General of Armored Troops, refused to certify the Panther as ready for action, but two battalions equipped with a total of 200 Panthers were nevertheless sent to the Eastern Front for the July 1943 Operation *Zitadelle* offensive against the Soviet Kursk salient.

The combat debut of the new tank on July 5 was disappointing, as mechanical breakdowns, antitank mines, difficult terrain, and enemy fire rapidly reduced the number of Panthers at the front. By July 10, the two battalions had only ten operational tanks. The performance of the Panther improved during the subsequent defensive fighting in Ukraine, although more continued to be lost to mechanical problems than to enemy action. Panthers produced after the first batch of 250 were outfitted with the more powerful 700bhp Maybach HL230 P30 liquid-cooled gasoline engine, easing the strain on the transmission and improving acceleration and cross-country performance. The 7.5cm KwK 42 L/70 main gun proved exceptionally capable, and Panther units catching advancing Soviet tanks at long range were able to inflict heavy losses, with some destroyed at 1,600yd or more. A total of 842 Panther Ausf Ds left the factories before production halted in September 1943.

The Panther Ausf A

In June 1942, even before the Panther Ausf D entered battle, Hitler suggested further increasing the tank's frontal armor to 100mm and side armor from 40mm to 60mm, resulting in the pursuit of a new tank that would weigh over 50 tons and be known as the Panther II. As it became clear such an effort would dramatically slow production, the Heereswaffenamt instead decided to integrate select improvements to the existing turret, resulting in the Panther Ausf A, which featured a new hemispheric commander's cupola with seven vision blocks rather than Ausf D's drum-shaped cupola and an improved bore evacuator to better clear out gases from its 7.5cm main gun. The Ausf A also had a variable-speed turret rotation capability instead of the Ausf D's single-speed rotation. Rather than the "letter box" hatch in front of the radio operator



in the hull, the Ausf A included a ball mount for a glacis machine gun. A coating of *Zimmerit* antimagnetic mine protection paste was added to some of the Ausf As, and as on later Ausf Ds, the number of bolts on the large road wheels was increased from 16 to 24 to improve stability. Four firms (Daimler-Benz, MAN, MNH, and Henschel) produced a total of 2,200 Panther Ausf As by the time production ended in July 1944.

The Panther Ausf A's improved cupola and turret were well received when the model reached the Eastern Front, although reports of mechanical failures continued. Some Ausf As were sent directly to Panzer divisions in the field to replace losses, but the majority were used to reequip full battalions previously equipped with obsolete PzKpfw IIIs. The Wehrmacht had planned to reequip its Panzer divisions entirely with Panthers, but as production was inadequate, decided that full-strength Panzer divisions would now have 76-tank Panther battalions along with one up-gunned PzKpfw IV battalion carrying the 7.5cm KwK 40 L/43 main gun.

The Panther Ausf G

Germany switched Panther production from the Ausf A to the Ausf G during March–July 1944. The Ausf G carried the improved Ausf A turret, but had a modified chassis. The armor side plates now sloped at 29 degrees from vertical rather than 40 degrees, but the armor thickness was increased from 40mm to 50mm. To compensate for the increase in weight, the thickness of the frontal lower plate was reduced as was the thickness of the belly armor. The redesigned chassis increased the Ausf G's internal

A Panther Ausf A bearing the unit insignia of the 5. SS-Panzer-Division *Wiking*, summer 1944. Although continuing to be troubled by reliability problems, Panthers played a key role in stiffening German rearguard actions on the Eastern Front during the last years of World War II. (ullstein bild/ullstein bild via Getty Images)

Captain Henry V. Baushausen and Lieutenant Gardner Colson of the 359th Infantry Regiment, 90th Infantry Division, examine a knocked-out Panther Ausf A of the 9. Panzer-Division's Panzer-Regiment 33 during the Normandy campaign, August 28, 1944. In September, the 90th Infantry Division would defeat Panzer-Brigade 106 when the latter was launched in a spoiling attack against US forces advancing toward Lorraine. (Keystone/Hulton Archive/Getty Images)



space, which enabled it to carry 82 rather than 79 main-gun rounds. In the front of the hull, the driver's vulnerable visor was removed, and he was given a periscope for driving with closed hatches. Ultimately, 2,961 Panther Ausf Gs left the factories from March 1944 to the collapse of Germany 14 months later. Peak production was in July 1944 with 368, but Allied bombing subsequently reduced the monthly levels of Panther production to 275–350 for the rest of 1944. As the German economy collapsed in 1945 production decreased sharply before the factories were overrun by Allied and Soviet forces.

PzKpfw V Panther Ausf G	
Crew	5
Loaded weight	49.4 tons
Dimensions (L × W × H)	28ft 5in × 10ft 9in × 9ft 10in
Main gun	7.5cm KwK 42 L/70
Main-gun ammunition	82
Secondary armament	2–3 7.92mm MG (bow and coaxial); could mount additional 7.92mm on commander's cupola
Engine	Maybach HL230 P30
Horsepower	690hp at 3,000rpm
Maximum speed	29mph
Fuel	190 gallons
Range (road)	125 miles
Ground pressure	12.5psi
Power-to-weight ratio	13.97hp/ton

PANTHER AUSF G, ARRACOURT, SEPTEMBER 1944





Normandy, July 21, 1944: a knocked-out Panther Ausf G of the Panzer-Lehr-Division is examined by troops of the 83d Infantry Division. (Fred Ramage/Keystone/Hulton Archive/Getty Images)

Other variants

The Panther chassis was used for three major variant vehicles. The least modified were the *Befehlspanzer* command tanks. The *Panzerwaffe* received a total of 329 *Befehlspanzer*, and kits were available to transform normal Panthers into command tanks if none were available. The designers sought to make *Befehlspanzer* resemble normal Panthers so the command tanks would not be singled out by the enemy on the battlefield as priority targets. *Befehlspanzer* had the 7.92mm MG 34 coaxial machine gun removed (the opening was stopped by a plug) and carried only 64 rounds for the main gun so as to make more room available for radio equipment. Most *Befehlspanzer* were the SdKfz 267, intended to serve at command levels from company to regiment. The less common SdKfz 268 was equipped to coordinate Luftwaffe tactical air support for Panzer units.

The Wehrmacht fielded the Panther and Tiger I without an adequate recovery vehicle to retrieve damaged tanks, as the standard unarmored *Zugkraftwagen* halftrack was unable to fulfill the task. As a result, numbers of these tanks that could have been recovered from the battlefield had to be abandoned. Production of a dedicated *Bergepanther* (Panther recovery vehicle) began in July 1943, and 297 were fielded by the end of World War II.

The third and final major use of the Panther chassis was the *Jagdpanther* (Hunting Panther), which placed the 8.8cm PaK 43/3 L/71 gun in a turretless design. Production was delayed, however, with the first prototype not leaving the factory until October 1943. An estimated 413 *Jagdpanthers* were produced by the end of World War II.

THE M18 76mm GMC

Like the Panther, the design of the M18 tank destroyer was driven by shock – but while the Panther was a consequence of the Panzers encountering the T-34 in 1941, the M18 emerged as a result of the Panzer divisions' destruction of the French military in 1940. The US Army immediately formed its own armored branch, but its new tank divisions were intended for breakthrough and exploitation operations rather than fighting enemy tanks. To meet the Panzer threat, something beyond providing front-line infantry with its own antitank guns was required and a special planning staff was formed in May 1941 to investigate potential solutions. Headed by Lieutenant Colonel Andrew D. Bruce, the team concluded that the US Army needed a new force able to move rapidly and destroy any enemy armored divisions that broke through forward defenses. Bruce wanted the new force to be equipped with self-propelled antitank units with high mobility, speed, and firepower.

The US tank-destroyer concept was tested during the November 1941 Carolina Maneuvers in which an experimental mobile antitank group encircled and destroyed a stalled armored regiment of the 1st Armored Division that had run out of fuel. Although the tankers protested that the exercise rules were biased to favor antitank weapons, Bruce and his staff claimed the maneuvers validated their approach to defeating the Panzer divisions. On November 27, Bruce's staff was redesignated the Tank Destroyer Test and Firing Center, and later the Tank Destroyer Command. The new force was designated "tank destroyer," rather than "antitank" to reflect its offensive orientation and its motto, "Seek, Strike, Destroy," reflected its aggressive doctrine. The year 1942 saw the formation of tank-destroyer battalions and the publication of field manual FM 18-5 *Organization and Tactics of Tank Destroyer Units* to guide their employment. Bruce and his staff immediately began to seek the development of a purpose-built tank destroyer that would combine exceptional speed and a capable tank-killing gun, requirements that would ultimately lead to the development of the M18 76mm GMC.



US tank-destroyer battalions initially deployed into action in North Africa with improvised weapons, later joined by the M10 3in GMC, shown here in Tunisia in early 1943. The M10 had an open turret with a 3in gun mounted on an M4 medium-tank chassis but was disliked by the Tank Destroyer Command as it lacked the high speed considered critical to tank-destroyer operations. (© CORBIS/Corbis via Getty Images)

At first, US tank-destroyer battalions had to be formed and deployed into combat armed with improvised weapons. Following reports that French forces in 1940 had some success employing antitank guns on the backs of trucks, the US Army mounted a 37mm M3 antitank gun (its copy of the German 3.7cm antitank gun) on the back of a $\frac{3}{4}$ -ton truck, producing the M6 37mm GMC. At the same time, World War I-vintage 75mm French guns were mounted on the rear decks of M3 halftracks and fielded as the M3 75mm GMC. Tank-destroyer battalions were soon able to upgrade to the M10 3in GMC. The M10 was based on the M4 medium-tank chassis, modified with an open-topped turret carrying a heavier 3in (76.2mm) gun rather than the M4's 75mm M3 main gun. Lieutenant Colonel Bruce and the Tank Destroyer Center, however, only reluctantly accepted the M10 as it was no faster than a standard M4 tank and continued to seek their own specialized design.

US tank-destroyer battalions deployed into combat as part of the Operation *Torch* landings in November 1942 in French North Africa. As Allied forces attacked into Tunisia and began to engage German forces, it soon became evident that the Panzer threat had changed. Rather than facing penetrations by massed, tank-heavy Panzer divisions, US forces found that German armor operated in smaller, combined-arms formations fully integrated with mechanized and motorized infantry, artillery, and other supporting arms. The M6 truck-mounted guns were soon withdrawn from combat due to their extreme vulnerability and inadequate armament, and the M3 75mm halftracks and M10 tank destroyers also suffered heavy losses when engaging German tanks. The most significant clash between tank-destroyer battalions and a large enemy armored force took place during the battle of El Guettar in late March and early April 1943. The tank destroyers claimed to have destroyed 30 tanks of the attacking 10. Panzer-Division, but the two battalions engaged lost 20 M3 halftracks and seven M10 tank destroyers. Bruce and the Tank Destroyer Command claimed the engagement validated the tank destroyer's role, but due to the heavy losses suffered tank-destroyer doctrine was now openly questioned in US Army circles, and no tank-destroyer battalions were used in the subsequent invasion of Sicily.

Developing the Hellcat

Despite questions about the effectiveness of the tank destroyers in North Africa, Lieutenant Colonel Bruce and the Tank Destroyer Center continued to push for a dedicated design with high speed, capable firepower, and light armor. Bruce compared his ideal tank destroyer to the battlecruisers of World War I navies – faster than battleships, with heavy guns, but more lightly armored – evidently ignoring the disastrous loss of British battlecruisers at the battle of Jutland in May–June 1916. The route to the M18 was long, as the Tank Destroyer Command reviewed a series of prototype vehicles only to reject each in turn, searching for higher speeds and a heavier main armament. An early concept was to place a 37mm M6 gun with an open turret on the T9 light-tank (airborne) chassis, and seeking faster speed, Bruce directed the addition of a Christie-style suspension resulting in the T42 37mm GMC. After realizing a more powerful gun was required, a subsequent T49 prototype with a 57mm M1 gun was delivered for testing in July 1942. The T49 used a new torsion-bar suspension rather than the bulky Christie system but the Tank Destroyer Command considered the 38mph maximum speed to be inadequate. The Tank Destroyer Center



By 1944, the US tank-destroyer force had fielded the M18 76mm GMC, designed to meet the doctrinal requirement for a fast, lightly armored tank-killer, although it often had to fulfill other roles in the field. Here, an M18 from the 705th Tank Destroyer Battalion supports the 83d Infantry Division as it advances into Saint-Malo in August 1944. Note the improvised hedge-cutter. (NARA)

also sought to further increase the power of the main gun, leading to the installation of a 75mm M3 gun in an open-topped turret on the T49 prototype. The resulting T67 prototype was tested in late 1942, but Bruce directed the design be revised with a 76.2mm M1 gun and a Continental (Wright) R-975 air-cooled radial engine in place of the T67's dual Buick Series 60 engines. The resulting T70 76.2mm GMC retained the T67's torsion-bar suspension but featured the more powerful R-975 engine and the 76.2mm M1 main gun.

Tensions arose during the design process between the Tank Destroyer Center and Lieutenant General Lesley J. McNair, commander of US Army Ground Forces (AGF). Bruce and his staff repeatedly sought improvements to the design, while McNair and the AGF pushed to have the new tank destroyer available for the 1944 cross-Channel invasion. Following pressure from McNair, production of 1,000 T70s was ordered before testing had even begun. Buick completed the first pilot vehicle in April 1943 and six were delivered by July. The first testing was conducted at the same General Motors Proving Ground used for its passenger cars in Michigan, followed by a thorough testing program at Aberdeen Proving Ground in Maryland that soon identified the need for 157 major modifications. Owing to the cramped turret, the main armament was shifted 2in to the right to give the gunner more room, and the gun itself was ultimately mounted at a 45-degree angle to allow the loader enough space to place shells in the breech.

Overall, however, the design was sound, and at last met Bruce's desire for a speedy tank destroyer. The T70 could reach 55mph, making it the fastest tracked vehicle of the war. The T70 was also extremely agile, with a good power-to-weight ratio, and good track flotation. For its main armament, the US Army had developed the lightweight M1 version of its 3in M7 gun, using the same projectile but with a different propellant casing. To differentiate the two guns, the US Army referred to the T70's M1 as "76mm" even though in reality it had the same 76.2mm bore diameter as the 3in M7 gun.

An M18 of the 603d Tank Destroyer Battalion fires point-blank at a German pillbox to clear a path through a street in Brest. One of the initial three M18-equipped tank-destroyer battalions deployed to France, the 603d Tank Destroyer Battalion operated with the 6th Armored Division throughout the Northwest European campaign. The battalion accompanied the division on its dash through Brittany after the breakout from Normandy to the outskirts of Brest before rejoining XII Corps in time for the battles around Lunéville and Arracourt. (US Army/Interim Archives/Getty Images)



The design was standardized as the M18 76mm GMC in March 1944, but 684 of the early-production vehicles had to be returned to Buick for modification due to issues identified during testing. In the event, 640 of the T70s returned to the factory were ultimately modified to serve as T4E1 and M39 utility vehicles. (Bruce and the Tank Destroyer Center had envisioned an entire range of vehicles based on the T70 chassis, including a command car, armored personnel carrier, antiaircraft vehicle, and cargo carrier, although only the last variant was ultimately developed.) Buick's publicity department wanted the vehicle to have a more exciting name than M18 76mm GMC, and began to promulgate "Hellcat," although this was never an officially approved US Army designation.

The limitations of the T70 design would become evident in combat in 1944. Tank destroyers were planned to have a main gun capable of destroying enemy tanks, but the T70's 76.2mm M1 was essentially the same as the 3in gun deployed on the M10 two years earlier. The 3in gun had proven to have good capabilities against the PzKpfw IIIs and IVs encountered in Tunisia and Italy in 1942 and 1943, but the US Army was not alert to the increases in German tank capabilities driven by battles on the Eastern Front. Tigers and Panthers were encountered in small numbers only in Italy and the US Army expected to confront similar limited numbers in France. Although tank-destroyer units had been repeatedly used in an infantry-support role in the Italian campaign, the T70 lacked bow and coaxial machine guns that US tanks used to engage infantry and other "soft-skinned" targets and only included a .50-caliber M2 HB heavy machine gun mounted on the turret in an exposed position. The T70's fast speed and mediocre firepower was accompanied by extraordinarily thin armor – less than that carried on the M8 armored car, and barely adequate against enemy small-arms fire. The T70's open turret also exposed the gun crew to enemy artillery fire or grenades.

Fielding and doctrine

Debate continued to embroil the US Army's tank-destroyer doctrine in the months before D-Day. During the Italian campaign, German Panzers were very rarely engaged in any strength. Allied forces were typically on the offensive, and commanders were loath to leave tank-destroyer battalions, as per doctrine, in reserve to meet massed



Two views of a restored M18 equipped with the late-war 76.2mm M1A2 main gun with the muzzle brake. Although several upgrades were considered, US forces never fielded up-armed or up-armored versions of the M18, and only the M39 utility vehicle with the M18 chassis entered production. (Dorling Kindersley: Gary Ombler/Gordon McKenna/Alamy Stock Photo)

Panzer attacks that never materialized. As a result, the M10 battalions in Italy were extensively used in company- or platoon-sized elements to support infantry operations or to join divisional howitzer battalions for indirect-fire support. Doubts generated by operations in Italy led to the revision of the FM 18-5 tank-destroyer employment manual, but ongoing debates between the AGF and the Tank Destroyer Center delayed the finalization of a new edition until 1944 – too late to influence the campaign in France. Lieutenant General McNair, never a convert to the self-propelled tank destroyer, used reports of towed antitank guns being used effectively by British forces in North Africa to order 15 tank-destroyer battalions converted to a towed organization in March 1943, increased to half of all tank-destroyer battalions in December.



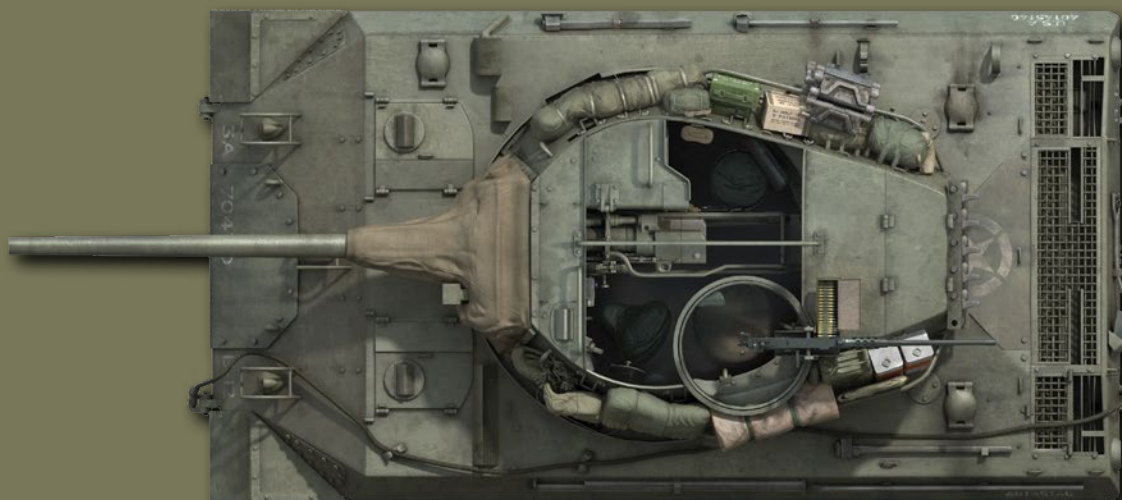
M18s of the First US Army advancing through Düsseldorf in 1945. Note the muzzle brake. By the last year of the war, 20 US tank-destroyer battalions in the ETO would be equipped with M18s. [Author's collection]



Six M18s were dispatched to Italy for combat testing before D-Day and joined the 894th Tank Destroyer Battalion in the Anzio beachhead in May 1944 for the Operation *Diadem* breakout toward Rome. The battalion commander considered the M18s to be too lightly armored to join one of his M10 companies and instead added them to the organic reconnaissance companies found in all self-propelled tank-destroyer battalions. In that role, he reported the M18s to be fast and reliable, although overall he considered the design to be too poorly protected to replace the M10. As US forces advanced north from Anzio, 11 towed and 19 self-propelled tank-destroyer battalions, three of the latter – the 603d, 704th, and 705th – equipped with M18s, were in Britain ready for the invasion of France. Based on reports from the Italian campaign, the First US Army stated it would only operate M10-equipped tank-destroyer battalions. The three M18-equipped battalions were to deploy with Patton's Third US Army when activated.

M18 76mm GMC Hellcat	
Crew	5
Loaded weight	18.8 tons
Dimensions L × W × H	21ft 10in × 9ft 5in × 8ft 5in
Main gun	76mm gun M1A1
Main-gun ammunition	45
Secondary armament	M2 HB (.50-caliber heavy machine gun)
Engine	Continental R-975-C4
Horsepower	350hp at 2,400rpm
Maximum speed (level road)	55mph
Fuel	165 gallons
Range (road)	100 miles
Ground pressure	12.6psi
Power-to-weight ratio	18.6hp/ton

M18 HELLCAT, ARRACOURT, SEPTEMBER 1944



TECHNICAL SPECIFICATIONS

The Panther's excellent balance of firepower, armor, and mobility have led to it often being considered the best overall tank design of World War II, although production issues limited the total number fielded and poor reliability marred its performance in the field. In contrast, the M18 was designed to perform a specialized doctrinal role that resulted in a high-speed vehicle, with only an adequate main gun, and some of the thinnest armor deployed on a late-war armored fighting vehicle.

Recovering a broken-down Panther on the Eastern Front. The Panther's superb firepower and frontal protection were often negated by endemic reliability problems, and readiness levels remained lower than those of other World War II tanks. (Wolff & Tritzschler/ullstein bild via Getty Images)



FIREPOWER/LETHALITY

The Panther's 7.5cm KwK 42 L/70 main gun was the most impressive feature of Germany's new medium tank. "KwK" was an abbreviation of *Kampfwagenkanone* (tank gun), and "42" referred to the year of its acceptance. The Panther's gun was optimized for long-range antitank engagements and had superior performance to the Tiger I Ausf E's better-known 8.8cm KwK 36 L/56. The KwK 42 used PzGr 39/42 armor-piercing capped ballistic-capped (APCBC) rounds to engage enemy tanks or other hard targets and could penetrate 112mm of armor at 1,000m. The PzGr 39/42 round had a small explosive charge that increased damage after penetration. The rarer PzGr 40/42 round with its tungsten-core armor-piercing shell could penetrate 149mm of armor at 1,000m, but shortages of tungsten limited German production to just 18,800 PzGr 40/42 rounds in 1943. Research during the war indicated that most Panther engagements were in the range of 850m, at which distance it could easily penetrate the frontal armor of its primary Allied opponents, the T-34 and M4 medium tanks. For "soft-skinned" targets, the KwK 42 employed the SpGr high-explosive round. Unlike the US Army, the German armed forces did not mount heavy machine guns on their medium tanks, and the Panther Ausf G had two 7.92mm MG 34 machine guns, one in the bow and the other in a coaxial mount with the 7.5cm main gun. An additional MG 34 could be mounted on the commander's cupola to be used against enemy aircraft.

The Panther Ausf G gunner's excellent TZF 12a telescopic sight allowed the crew to engage targets as far as 3,000m (3,281yd) away, although tank commanders would be unlikely to risk wasting rounds at such long range. The TZF 12a had markings

A US M8 armored car passes a knocked-out Panther Ausf A from the 2. SS-Panzer-Division *Das Reich* in Normandy, August 1944. The loader's hatch on the Panther has been left open, likely by the crew evacuating the tank. The hatch also eased the task of reloading the tank with main-gun ammunition. [Fred Ramage/Keystone/Hulton Archive/Getty Images]



PANTHER TURRET AND AMMUNITION



- | | |
|---------------------------------------|--|
| 1. 7.5cm KwK 42 L/70
main gun | 8. Recoil guard |
| 2. Gun mantlet | 9. Gunner's seat |
| 3. Antiaircraft 7.92mm
machine gun | 10. Azimuth indicator |
| 4. Commander's cupola | 11. Gunner's TZF 12a
telescopic sight |
| 5. One of seven vision blocks | 12. Pzgr 39/42 (AP) |
| 6. Loader's hatch | 13. Pzgr 40/42 (AP) |
| 7. Commander's seat | 14. Sprgr 42 (HE) |

M18 HELLCAT TURRET AND AMMUNITION



1. .50-caliber heavy machine gun
2. Turret traverse
3. Turret azimuth indicator
4. Vehicle radio receiver
5. Spare track
6. M1A1 76mm gun in M62 combination mount
7. Gunner's periscope
8. Storage for driver's dust cover
9. Loader's ready ammunition rack
10. Angled gun breech
11. Storage racks
12. Gun breech protective frame
13. M42A1 (HE)
14. M62A1 (APC)
15. M79 (AP)
16. M88 (Smoke)
17. T4 (HVAP)

allowing range estimation up to 2,000m (2,187yd) for the standard PzGr 39/42 armor-piercing rounds, 3,000m for the tungsten-core PzGr 40/42, and up to 4,000m (4,374yd) for high-explosive rounds. The sight allowed a 97 percent probability of a first-shot hit at 1,000m (1,094yd), and a 29 percent probability of a first-shot hit at 2,500m (2,734yd). The Panther gunner lacked a wide-view periscope, however, and only had a “soda straw” view through his gunner’s sight, leaving him effectively blind until the tank halted and the tank commander indicated where the target was on the battlefield. After halting, it typically took the gunner 20–30 seconds to locate and engage the target, limiting the Panther’s ability to fire the critical first shot in a meeting engagement, particularly at close ranges. The Panther turret featured a power traverse and could move 360 degrees in 15 seconds, but it did not have a separate motor, and relied on engine revs to move at maximum speed. The gunner and driver had to coordinate to ensure power was available to traverse. The balance of the Panther turret was also awkward, with the long main gun not offset by a bustle as in US tanks. The Panther Ausf G carried 82 rounds for the main gun, all in the hull. The loader would use the rounds carried in the hull on his side of the tank, the right, as his initial “ready rounds.” Although maneuvering the large shells in the turret was difficult, an experienced loader could theoretically manage as many as 6–8 rounds per minute in action. The Panther featured a loader’s hatch in the rear of the turret, making the restocking of the Panther with ammunition – always a tiring task – easier.

The M18 carried the 76.2mm M1A1 L/52 gun with a slightly larger bore than the KwK 42 L/70 mounted on the Panther but with inferior performance. The M1A1 fired M62A1 armor-piercing capped-tracer (APC-T) rounds that were ineffective against the Panther’s frontal armor at virtually all combat ranges. To defeat a Panther, M18s had to be able to hit the German tank’s sides or rear or be able to hit the lower gun mantlet and deflect a shot downward through the weaker 16mm of armor above the driver and radio-operator positions. As M4 and M18 crews realized the difficulties engaging Panthers from the front, they began to use different tactics that aimed to pin

Technical main gun data		
Tank	Panther	M18 76mm GMC
Main gun	7.5cm KwK 42	76.2mm M1
Tube length	L/70	L/52
Armor-piercing projectile	PzGr 39/42	M62A1
Type	APCBC	APC-T
Initial muzzle velocity	3,048ft/sec	2,598ft/sec
Projectile weight	14.99lb	15.43lb
Propellant weight	8.09lb	3.62lb
Penetration [@500m/547yd, 30 degrees]	117–129mm	92–96mm
High-explosive projectile	SprGr 42	M42A1
Projectile weight	12.65lb	12.79lb
Explosive fill	23.03oz	13.75oz



An M18 on the move during the Battle of the Bulge. The United States failed to realize the improvements underway in German tank design and fielded the M18 in 1944 with a 76.2mm main gun that was unable to penetrate the frontal armor of the Panther. (Author's collection)

down a Panther from the front while other M4s and M18s maneuvered to try to engage from the sides. Techniques included firing white-phosphorous shells to blind enemy tanks or hitting them with high-explosive rounds. Either technique could cause inexperienced German crews to abandon their tanks.

The inability of the 76.2mm shell to penetrate the Panther's frontal armor led to efforts to rush T4 high-velocity armor-piercing-tracer (HVAP-T) rounds (designated the M93 in February 1945) to the front. These rounds had been under development since 1943, and the HVAP design had a core of heavy and dense tungsten with an aluminum shell. The lighter HVAP-T had an improved muzzle velocity and on impact, the tungsten core would penetrate as the aluminum covering peeled away. HVAP rounds were airlifted to France in August 1944, and tests on captured Panthers revealed improved performance over the M62A1, with the HVAP round able to penetrate the Panther's mantlet at 800–1,000yd but still with little capability against the glacis. Shortages of tungsten carbide and problems with production limited the supply of HVAP rounds and most tanks and tank destroyers only typically received two of the improved rounds each month until early 1945.

The M18's main gun generated an excessive blast when fired, obscuring the fall of shot and leading some M18 commanders to dismount before firing and shouting directions to the gunner. The M1A1C main gun was identical to the original gun but had threads in the muzzle to allow installation of a muzzle brake to reduce the blast when firing the gun. The M1A2 main gun included the muzzle brake and had a tighter rifling twist to improve projectile stability at longer ranges. The final 700 M18s produced were fielded already fitted with the muzzle brake. Crews reported that the muzzle brake made the M18, which already had an unusual silhouette for a US armored fighting vehicle with its low profile and large road wheels, resemble a German tank even more closely, increasing the risk of "friendly fire" incidents.

An M18 of the 824th Tank Destroyer Battalion firing in support of US infantry in Wiesloch in April 1945. Initially equipped with towed guns, the battalion transitioned to the self-propelled M18 in March 1945. [Keystone/Hulton Archive/Getty Images]



The open top of the M18's turret gave the commander excellent situational awareness, although at the price of exposure to overhead fire. The commander typically stood in the turret in action, and it was not uncommon for platoon or section leaders to dismount to guide the M18 to good firing positions. The gunner sat forward of the commander on the left side of the gun breech and had both an M4A1 periscopic sight in the top front of the turret to scan the battlefield and an M72C or M76C direct-sight telescope to be used when shifting to aim and fire the main gun. The turret had a rapid traverse, and gunners would swing the turret to the target's azimuth but then use manual controls to precisely lay the gun. The loader stood in action and had access to nine rounds in a ready rack and 18 rounds in each hull sponson for a total of 45 rounds. The desire for a low profile had made the M18 much smaller than the M4 and M10, and crew conditions in the turret were cramped. The M1 gun had been offset to the right to allow the gunner to function, and the main gun itself was, uniquely, tilted at 45 degrees to allow the loader on the right of the gun enough room to be able to manipulate shells into the breech.

The M18 lacked a coaxial or bow machine gun as commonly carried on US tanks, reducing its ability to suppress enemy positions when providing infantry support. The M18 carried a .50-caliber M2 HB heavy machine gun mounted in the turret. The commander could fire the weapon against ground targets in addition to aircraft while standing in the turret – unlike some US tank designs that forced him to stand on the rear deck to use it – but he was still exposed to enemy fire. M18 crews without infantry support could be pinned in their turret by enemy small-arms fire and unable to reply, allowing German infantry to approach close enough to toss grenades into the open turret.

ARMOR/SURVIVABILITY

The Panther had excellent frontal armor, and while almost 10 tons lighter than the Tiger I Ausf E, the Panther had superior frontal protection. The Panther Ausf G's frontal glacis had 80mm of rolled homogenous armor (RHA) sloped at 55 degrees, giving the equivalent of 145mm (RHA). The slope caused many enemy rounds to ricochet off. The main gun's rounded mantlet featured 100mm armor, but when it was realized that some shots could be deflected off the lower portion of the mantlet and penetrate the tank through the thin top armor above the driver, a "chin" was added to Ausf Gs produced after September 1944. The T-34-85's 85mm ZiS-S-53 main gun could penetrate the Panther only at ranges of 550yd or less, and the 75mm on the M4 struggled to penetrate even at point-blank range. While the Panther was highly protected to the front, its side and rear armor was much thinner, and the Ausf G also had less sharply sloped side armor than the Ausf D and Ausf A. Most Allied tanks could penetrate the Ausf G's side and rear armor at ranges of 1,640yd or more, and the Panther's storage of main-gun rounds in internal hull-side sponsons meant that penetrating shots were likely to set off catastrophic explosions within the tank. The Panther's top protection was weak, and the engine deck was vulnerable to artillery fire and fire from strafing enemy aircraft.

The original Panther Ausf D had smoke grenades mounted on each side of the gun mantlet, but they were removed when crews reported that small-arms fire could set them off, blinding the crew with smoke. In response to Hitler's continued urging that the Panther's armor be increased, designers added soft-metal *Schürzen* plates to the side of the hull to protect against Soviet 14.5mm antitank rifles that could disable the



A key advantage of the Panther tank was its thick frontal armor. This captured Panther has been subjected to test-firing by a variety of US guns, and none has fully penetrated. US tanks and tank destroyers had to try to maneuver to hit the Panther's weaker side or rear armor in tank-vs-tank engagements. (US Army)

An M18 in a village position. The M18 and other US tank destroyers were particularly vulnerable during operations in built-up terrain due to their open turrets. (Hulton Archive/Getty Images)



track system. The *Schürzen* side plates tended to be knocked off as Panthers maneuvered under combat conditions, however. The Germans also applied a coating of *Zimmerit* antimagnetic mine protection paste to Panthers leaving the factory to prevent enemy infantry from attaching hollow-charge magnetic antitank mines. The application of *Zimmerit* was halted in 1944, however, due to reports from the field that the paste could catch fire in battle. Air attack was an ever-present threat on the Western Front, and the Panther's engine deck was particularly vulnerable to Allied fighter-bombers, leading to the extensive use of foliage for camouflage, and posting crew members as lookouts to watch for enemy aircraft. Early Panthers had pistol ports for close defense, replaced in the Ausf G with a *Nahverteidigungswaffe* close-defense grenade launcher in the turret roof that would allow the loader to fire grenades against enemy infantry mounting the tank. The device could also be used to fire smoke grenades or illuminating flares.

The M18 had very minimal armor, and some German antitank rounds penetrated one side of the vehicle and exited the other. The turret was a welded assembly and featured 13mm RHA on the sides and to the rear. The M1 main gun was mounted in a cast-iron plate gun shield on the front of the turret. The plate's thickness varied from 19mm to 25mm. The hull featured welded rolled homogeneous steel plate only 13mm

Comparative armor		
	Panther Ausf G	M18
Mantlet	100mm	19mm@0–60 degrees
Turret front	110mm@5 degrees	25mm@23 degrees
Turret side	45mm@25 degrees	13mm@20 degrees
Upper hull front	80mm@55 degrees	13mm@24–64 degrees
Lower hull front	60mm@55 degrees	13mm@0 degrees
Upper hull side (mm)	40mm@40 degrees	13mm@13 degrees

thick on the front, sides, and rear. The turret was open apart from a small front plate and an attached right-side plate that supported the ready rack with nine main-gun rounds. Overall, the M18 had even less armor than that carried on the M8 armored car and was barely proof against enemy small-arms fire, with the open turret vulnerable to grenades and mortar and artillery fire. Most M18 crew casualties were the result of enemy artillery fire.

MOBILITY AND RELIABILITY

Although the Panther was classified by the *Panzerwaffe* as a medium tank, Hitler's orders to increase its frontal armor increased the design's weight, and a loaded Panther Ausf G weighed in at 49.4 tons, resulting in an underpowered tank that suffered significant reliability problems throughout its combat service due to the engine and power trains' inability to handle the weight of the final design. The Panther's Achilles heel was its transmission and final drive, both of which were overtaxed by the tank's increased weight. The transmission was an elegant design but was prone to strip its single-teeth gears, particularly when operated by inexperienced drivers. The final drive presented an even more serious reliability problem, as it was inadequate for this heavy a tank, and while intended to last 1,500km (932 miles) could fail after as few as 150km (93 miles). The 190-gallon fuel tank yielded a road-range of 125 miles but given the frequent mechanical breakdowns that plagued the Panther, the Germans relied on rail transportation for long-distance moves.

Reliability problems began with the hastily fielded Panther Ausf D, and although many problems had been addressed by 1944, breakdowns continued to plague the design. In 1943, Panther reliability was rated at 37 percent, improving to 51 percent and 60 percent in August and September 1944 respectively, while US M4 reliability rates could reach 90 percent. In September 1944, enduring issues with transmission failure, time-consuming repairs, and shortages of spare parts meant that German units in Lorraine were often understrength with many Panthers sidelined, sometimes with only minor problems. Undertaking repairs on the Panther was extremely difficult. Its transmission was fully enclosed by the frontal armor plate. To replace the final drive, the transmission and driver's compartment had to be disassembled. The interlaced road wheels improved the ride of the tank, but working on or replacing one typically required the time-consuming removal of several others. Broader issues complicated the Panther's reliability situation, as Hitler's focus on overall production numbers meant that German industry did not produce adequate supplies of spare parts. The quality of both complete tanks and spare parts also suffered as skilled labor, vital to the German craftsmanship-focused industrial base, was increasingly drawn to the front.

Panthers being transported by train to the Normandy Front, 1944. The Panther's poor mechanical reliability meant most long-range movements had to be conducted by rail, making the tanks vulnerable to air attack, in particular on the Western Front. Panzer-Brigaden 111 and 113 both lost some Panthers to Allied air attack while being moved by train. (ullstein bild/ullstein bild via Getty Images)





An M18 during the fighting for Brest, September 12, 1944. The profile photo shows the M18's low silhouette and large road wheels, both features unusual for a US design. The M18s raced through Brittany and then eastward toward the Seine River and the German border, demonstrating the speed and reliability of the vehicle. [Signal Corps/Wikimedia/Public Domain]

After its initial teething troubles were dealt with, the M18 Hellcat had exceptional mobility and reliability. The first M18s – serial numbers 1–1350 – were powered by a Continental R-975-C1 radial engine that delivered 350hp, and gave the light, 18.8-ton vehicle its remarkable maximum speed of 55mph. After the 1,350th vehicle, M18s left the factory with the upgraded R-975-C4 engine that increased horsepower to 460hp at 2,400rpm. The M18's high speed proved to be of less value in the field than hoped, however. Long-range movement was often compromised by the limitations of the road network and the slower speeds of other large convoys, and M18s could rarely use their maximum speed. In action, crews tended to maneuver their M18s cautiously due to the weak armor and open turret top rather than dash around the battlefield. The M18's high degree of reliability, however, proved a major advantage in France, with the design allowing for easy maintenance. The transmission was easily accessible and the engine was mounted on sliding rails, and with rear hatches removed could be rapidly slid back for maintenance or, if needed, full replacement.

On paper, the Panther appeared to have major advantages in a direct duel with an M18. The Panther could destroy M18s at any range, and if the conditions were right could engage them at extremely long ranges of 2,000–3,000m. The M18's 76.2mm main gun was useless even at close range against the Panther's frontal armor, unless a round disabled a track or deflected off the gun mantlet into the driver's compartment. US Army after-action reports noted M18 rounds repeatedly bouncing off the thick, sloped frontal glacis of Panthers. The Panther, however, was vulnerable to side and rear shots, if battlefield conditions allowed the M18s to engage from those angles. At Arracourt, terrain and weather conditions and the superior training of M18 crews allowed them to overcome the limitations of their vehicles and dominate the attacking Panthers.

THE STRATEGIC SITUATION

The Third Reich suffered devastating reverses during the summer of 1944 on both the Eastern and Western fronts. Soviet forces began a series of offensives in June that destroyed whole German army groups and swept through Belorussia, the Balkans, and into Poland. In the West, Rome was captured by the Allies on June 4, followed two days later by the long-awaited cross-Channel invasion of France. After a summer of heavy fighting through the Normandy *bocage* (hedgerow) countryside, the Allies broke out into open country in August and streamed across France in full pursuit of the shattered defenders. Lieutenant General Jacob L. Devers' 6th US Army Group landed on France's Mediterranean coast on August 15 and rapidly advanced north along the Rhône Valley. By August 20, German forces in France had suffered 300,000 casualties since the June 6 landings, and only 184 of the 2,400 tanks and assault guns sent to the theater remained operational.

A steady stream of reinforcements and replacement troops and tanks kept Allied forces up to strength despite the months of grinding fighting in Normandy. The 12th US Army Group was equipped with 5,340 and the British 21st Army Group another 3,000 tanks and tank destroyers in August, giving the Allies almost a 100 to one armor superiority over the shattered German divisions. Morale was high as the Allied divisions raced across France, and their commanders hoped to vault the Rhine River and bring the war to an end in late 1944. Even in the heady days of late August, however, logistical shortages limited Allied options. German garrisons had rendered French ports inoperable before capture, and supplies for Allied forces were still being unloaded over the D-Day beaches. The rail network had been shattered by Allied



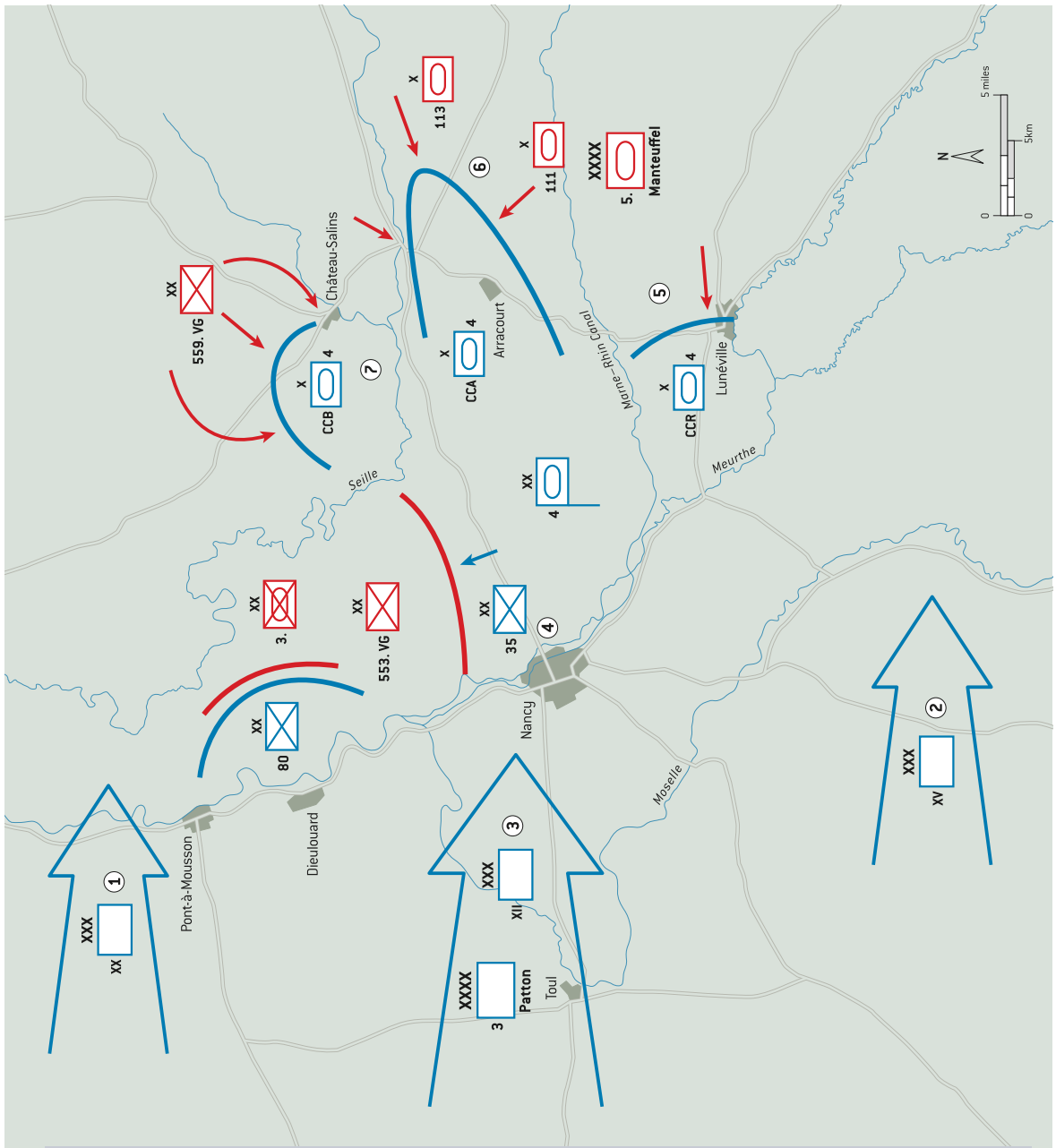
A US armored column during the breakout from Normandy in August 1944. An M18 is visible behind the advancing M4 medium tank. The M18 often displayed large white stars as its unusual silhouette could lead it to be mistaken for a German tank. (AFP via Getty Images)

airstrikes and truck convoys had to drive the supplies hundreds of miles to the forward troops. Field Marshal Bernard L. Montgomery forcefully pushed for a “single thrust” strategy with his 21st Army Group receiving supply priority, attacking through the Netherlands, outflanking the *Westwall* defensive line, and seizing the critical Ruhr industrial region. Lieutenant General Courtney H. Hodges’ First US Army, part of Lieutenant General Omar N. Bradley’s newly activated 12th US Army Group, would advance north of the Ardennes Forest to guard Montgomery’s flank. Lieutenant General Dwight D. Eisenhower, the theater commander, held to his pre-invasion plan for the advance into Germany on a broad front but was persuaded to give Montgomery’s September attack priority for immediate logistical support.

South of the Ardennes, Lieutenant General George S. Patton’s Third US Army had been brought to a halt in early September due to fuel shortages after rapidly dashing across central France. The aggressive Patton received enough fuel to resume the attack a few days later but was informed his offensive would only be sustained if he could swiftly cross the Moselle River. Patton immediately launched his corps in a renewed advance toward the Moselle, seeking to thrust rapidly through Lorraine to the Rhine. Patton approached the river with three corps: Major General Walton H. Walker’s XX Corps advanced toward the Metz area; Major General Manton S. Eddy’s XII Corps approached Nancy; and Major General Wade H. Haislip’s XV Corps guarded Patton’s right flank while establishing contact with the 6th US Army Group advancing along the Rhône Valley.

Hitler and his high command were acutely aware of the threat posed by Patton’s advance, and Hitler directed the assembly of a large armored force to launch a major counterattack. To control what would be known as the Vosges Panzer Offensive the 5. Panzerarmee headquarters, along with its XLVII. and LVIII. Panzerkorps, were shifted to Lorraine from the northern portion of the front. Hitler personally selected a hard-fighting division commander from the Eastern Front, General der Panzertruppe

OPPOSITE: This map shows the broader situation as Patton’s corps approached the Moselle River in September 1944 and the battles that ensued.



Events

1. Walker's XX Corps approaches the Moselle River in early September, aiming at the fortress city of Metz. On September 8, Panzer-Brigade 106 launches a spoiling attack against Patton's northern flank, leading to the brigade's destruction by the 90th Infantry Division at the village of Marly, off the map to the north.
2. Another spoiling attack, this time against Haislip's XV Corps, results in the destruction of the attacking Panzer-Brigade 112 at the hands of the French 2^e Division blindée at Dompierre, off the map to the south.
3. Eddy's XII Corps approaches the city of Nancy in early September, led by the 4th Armored Division.
4. The 4th Armored Division crosses the Moselle north and south of Nancy, and encircles and captures the city.
5. Hitler demands that the Vosges Panzer Offensive begin on September 18 with whatever forces are available. On that day, Panzer-Brigade 111 suffers heavy losses at the hands of the 4th Armored Division's CCR at Lunéville.
6. Panzer-Brigaden 111 and 113 launch a series of disjointed attacks during September 19–22 aimed at seizing Arracourt, but are repulsed each time by CCB's M4 medium tanks, along with the M18s of the 704th Tank Destroyer Battalion.
7. With the Panzer brigades largely destroyed, the 5. Panzerarmee attacks from the north, relying more on infantry and artillery, and the 4th Armored Division is forced to take up a positional defense. The Germans call off the offensive on September 29.



An M10 tank destroyer attached to the US 2d Armored Division passes a knocked-out Panther during the breakout from Normandy in August 1944. The *Schürzen* side armor plates remain on the tank, but have been penetrated by several hits. (Hugh Broderick/Pool/Keystone/Hulton Archive/Getty Images)

Hasso von Manteuffel, to take command of the 5. Panzerarmee and the offensive. Manteuffel would command a force that included the 11. and 21. Panzer-Divisionen, as well as the 3. and 15. Panzergrenadier-Divisionen just transferred from Italy. Notably, six of the new Panzer brigades recently formed at Hitler's direction were earmarked for the attack. As initially visualized by Hitler, the 5. Panzerarmee would mass west of the Moselle River and launch a major attack into Patton's southern flank, although he also considered options to pivot south instead and strike the 6th US Army Group as it advanced along the Rhône Valley. The rapid advance by the Third US Army, however, forced repeated revisions of German plans.

Lead elements of XX Corps and XII Corps subsequently established bridgeheads over the Moselle in the face of stiffening German resistance while Haislip's troops linked up with advance elements of the 6th US Army Group. In Eddy's sector, the 4th Armored Division crossed the Moselle both north and south of Nancy and rapidly encircled the city and its defenders. Once across, Patton ordered the division's aggressive commander, Major General John S. Wood, to prepare to advance to the Rhine. Hitler, Heeresgruppe G commander Generaloberst Johannes Blaskowitz, and Manteuffel all viewed the 4th Armored Division's position across the Moselle as the



Knocked-out tanks from the Normandy fighting, with Panthers in the foreground and PzKpfw IVs behind. The Germans committed 2,400 tanks in their effort to pin the Allies in Normandy, but by September 1944 only 184 were available to the surviving German forces that were attempting to halt the Allied offensive on the Westwall. [Signal Corps/Wikimedia/Public Domain]

major threat in the region, and the Vosges Offensive would now be aimed at cutting Wood's troops off from their bridges. A multiday meeting engagement, involving the largest clash of US and German tanks in the ETO to date, ensued.

The German attacking armored force at Arracourt was controlled by the 5. Panzerarmee. The Wehrmacht had operated four Panzer army headquarters on the Eastern Front, although these now often controlled infantry divisions due to the pressure of relentless Soviet offensives. In France, Panzergruppe West had served as the headquarters controlling the large number of Panzer divisions posted there to counterattack the cross-Channel invasion. With the German defeat in Normandy, the headquarters, now redesignated 5. Panzerarmee, withdrew into Belgium north of the Ardennes before Hitler transferred it to the south to lead the Vosges Offensive. The 5. Panzerarmee's headquarters only became operational in Lorraine on September 14, with Manteuffel assigned two *Panzerkorps* headquarters, XLVII. Panzerkorps under Generalleutnant Heinrich Freiherr von Lüttwitz, and LVIII. Panzerkorps under General der Panzertruppe Walter Krüger.

The 5. Panzerarmee was given a mix of heavily depleted and newly formed units. Hitler placed great hopes on the six new Panzer brigades that were originally assigned to the 5. Panzerarmee for the Vosges Offensive, but by the time of the fighting at Arracourt these had been reduced to two. Panzer-Brigaden 107 and 108, originally earmarked for the Vosges Offensive, were diverted to the Netherlands and the Aachen sector in response to Allied offensives north of the Ardennes. Panzer-Brigaden 106 and 112 were committed to early counterattacks against Patton's flanks as the Third US Army approached the Moselle and were rendered combat ineffective after suffering heavy losses. Only Panzer-Brigaden 111 and 113 would be available for the offensive against the 4th Armored Division that began on September 18.

THE COMBATANTS

THE PANZER BRIGADES

The Panzer brigades, a brainchild of Hitler's and originally earmarked for use on the Eastern Front, were the freshest and most up-to-strength units available to Manteuffel and key to the 5. Panzerarmee's offensive. Hitler was inspired by reports that the Tigers and Panthers of *Kampfgruppen* (battlegroups) such as the ad hoc Panzer-Brigade Bäke had destroyed hundreds of Soviet tanks and ordered that similar tank-heavy units be created to repeat their success. For several months, new German tank production was funneled directly to outfit the new Panzer brigades rather than replacing losses in the existing Panzer divisions heavily committed to both fronts. Heinz Guderian, serving at the time as the Inspector General of Armored Troops, opposed the new brigade structure, as there was insufficient time to train the new units properly, and the new-production tanks would have had much more impact on the German war effort if sent to replace losses in the existing, experienced, Panzer divisions.

The 5. Panzerarmee had initial difficulties bringing its subordinate Panzer divisions into action and for the first days relied primarily on its newly formed Panzer brigades for its offensive against the 4th Armored Division. Inspired by the example of ad hoc German *Kampfgruppen* in counterattacking Soviet forces on the Eastern Front, Hitler announced at a July 2 conference that the Wehrmacht should form new battlegroups, to be designated Panzer brigades, each composed of a Panther and a *Panzergrenadier* battalion along with some antitank and anti-aircraft units. The first four new Panzer brigades, numbered 101–104, were each fielded with a 45-tank Panther battalion and a three-company *Panzergrenadier* element; Panzer-Brigaden 105–110 were similar, but the *Panzergrenadier* battalion was increased to five companies.



During a meeting on September 1 discussing the defense of the *Westwall* defensive line, Generalleutnant Wolfgang Thomale, Guderian's chief of staff, suggested using three Panther battalions being formed in Germany as the basis for three additional Panzer brigades. These units, Panzer-Brigaden 111, 112, and 113, had a stronger organization with a 45-tank PzKpfw IV battalion added to the Panther battalion, along with a two-battalion *Panzergrenadier* regiment. The first ten Panzer brigades approached the on-hand tank strength of many Panzer divisions in 1944, and the last three that of a full-strength Panzer division. Unlike Panzer divisions, however, the new Panzer brigades lacked adequate combat-support elements, having only reconnaissance and engineer companies, minimal supply and maintenance elements, and no organic artillery. Tank-heavy battlegroups had often effectively counterattacked thin lines held by understrength Red Army infantry units on the Eastern Front, and Hitler planned for the new Panzer brigades to fulfill a similar role in 1944. Hitler wanted the new Panzer brigades to be led by aggressive Panzer officers from the Eastern Front, and Manteuffel, as well as the commanders of Panzer-Brigaden 111 and 113, had years of experience commanding mechanized units against the Soviets. In the West, however, where Allied units had excellent communication networks and could call upon powerful armored, artillery, and air support, the new Panzer brigades would prove much less able to repeat the successes achieved by similar units against Soviet opponents.

Panzer-Brigade 111 was organized on September 4, just 12 days before it was to be committed to battle, in Germany's Wehrkreis (Military District) VI. The brigade was led by Oberst Heinrich-Walter Bronsart von Schellendorf, a highly decorated veteran

Panther Ausf Gs from Panzer-Brigade 111 preparing for the German offensive against the 4th Armored Division at Arracourt in September 1944. German mechanized units heavily camouflaged their tanks and other vehicles with foliage to help protect against attack by Allied fighter-bombers. (NARA)

of combat on the Eastern Front. The brigade was assigned the re-forming I./PzRgt 16 from the 16. Panzer-Division and received 45 new-production Panthers during late August and early September. Panzer-Abteilung 2111 was formed from a Panzer replacement battalion and received 45 new PzKpfw IVs, ten StuG III assault guns, and eight 3.7cm Flakpanzer IV self-propelled antiaircraft guns during the first week of September. The brigade's two *Panzergrenadier* battalions had no unit training before entering combat, lacked halftracks, and were so short of transportation that some of their trucks were converted to use wood and coal power. During the move to the combat zone, one Panther and ten trucks were lost to air attack and another ten Panthers broke down.

Panzer-Brigade 113 was formed on September 4 in Wehrkreis XII in western Germany and was led by another experienced commander from the Eastern Front, Oberst Erich Freiherr von Seckendorff. The Panzer-Lehr-Division's re-forming I./PzRgt 130 with 45 tanks provided the brigade's Panther battalion. I./PzRgt 130 had not deployed to Normandy with the Panzer-Lehr-Division and unlike the rest of the brigade had spent some time training. The PzKpfw IV battalion, Panzer-Abteilung 2113, only received its tanks during the first week of September. Panzer-Brigade 113's two *Panzergrenadier* battalions had almost no halftracks and were transported by trucks, some of them civilian models. Half of the trucks were lost to air attack during rail transfer to the front.

Each of the Panther battalions attached to Panzer-Brigaden 111, 112, and 113 had three Panthers in their headquarters company and three companies with 14 Panthers each. In turn, each company consisted of two Panthers used by the company commander, and three platoons, each of four Panthers. Panzer-Brigade 106 was organized according to an earlier table of organization that had four Flakpanzer IVs added to the headquarters, and with the three Panther companies joined by an additional company with 11 Jagdpanzer IV tank destroyers. The Jagdpanzer IV carried a long 7.5cm PaK 42 L/70 main gun on a turretless PzKpfw IV chassis.

Panzer brigades in the German Vosges Offensive*

Panzer brigade	Panther	PzKpfw IV	Jagdpanzer	StuG III/IV	Flakpanzer	Total
106**	36		11		4	51
111	45	45		10	8	108
112***	45	46		10	8	109
113	45	45		10	8	108

* Panzer-Brigaden 107 and 108 were initially earmarked for the offensive, but ultimately sent into action north of the Ardennes due to Allied advances in the Netherlands and the Aachen sector.

** Panzer-Brigade 106 was rendered combat ineffective on September 8 during its preliminary attack against the US 90th Infantry Division at Mairy on Patton's northern flank.

*** Panzer-Brigade 112 was rendered combat ineffective on September 12 during an attack against the French 2^e Division blindée at Dompain on Patton's southern flank.

PANZER CREW TRAINING

The Wehrmacht had been extremely effective at producing well-trained and highly capable tank crews earlier in World War II. Guderian had streamlined the program in 1943 on becoming Inspector General of Armored Troops, increasing the emphasis on realistic preparation for actual combat conditions. Panzer crews were typically volunteers, and after basic training were sent to Panzertruppschule 1 in Wünsdorf for four months, with select graduates receiving an additional six to nine months of NCO or officer training. Panzer crews were given in-depth preparation for their assigned crew roles and cross-trained to fill in other positions in the crew if needed. The centerpiece of German tank training was the live-fire “battle-run” with crews engaging a variety of stationary and pop-up targets. Crews had to switch between firing high-explosive and armor-piercing rounds based on target type and engage at ranges of 1,200–2,000m. Sleds towed targets – with the silhouettes smaller than actual T-34s – that had to be hit at 800–1,200m. About one-third of the training was conducted at night or in poor visibility conditions. Once they graduated, Panzer crewmen were sent to the replacement battalions in Panzer divisions to be integrated into combat units as needed. As Panzer battalions returned to Germany to upgrade from PzKpfw IIIs to Panthers, a specific two-month training course was established at Erlangen in March 1943 to familiarize the troops with the new tank type.

German tank-crew training had been shortened due to the crushing need for replacements at the front and the impact of fuel shortages on the courses, and by late

Crews prepare their Panther Ausf As for action on the Normandy Front, 1944. The Panther featured the standard five-man crew configuration of German tanks serving during the latter part of World War II, with a commander, gunner, loader, driver, and assistant driver. In the Panther, the assistant driver also operated the tank's radio. [Harlingue/Roger Viollet via Getty Images]



Members of a Panther crew load gasoline cans, August 28, 1944. Late-World War II tanks such as the Panther with five-man crews were better able to shoulder the burden of daily maintenance and resupply of their armored fighting vehicles. (ullstein bild/ullstein bild via Getty Images)



1944, many Panzer trainees arrived at their units with only minimal preparation and were expected to learn on the job. Rather than volunteers, crewmen were often wounded personnel returned to duty, draftees, or Luftwaffe and Kriegsmarine airman and sailors sent to serve in the Heer (Army). The Panther battalions of Panzer-Brigaden 111 and 113 were in Germany and receiving their Panthers when reassigned from their parent divisions to serve in the newly formed Panzer brigades. They likely had numbers of veteran personnel, but only limited time to train with the new-production Panthers that they received two to three weeks before entering battle. There was no time for the Panzer brigades as a whole to conduct any unit training, as they were sent into battle less than two weeks after formation. Many brigade officers only met their colleagues at the rail stations where their units disembarked to drive directly into combat.

HEINRICH-WALTER BRONSART VON SCHELLENDORF

Heinrich-Walter Bronsart von Schellendorf was born north of Berlin into a Prussian noble family on September 21, 1906. Too young for service in World War I, he joined the Reichswehr in 1924. The Treaty of Versailles prohibited the Reichswehr from operating tanks, but it was allowed seven infantry and three cavalry divisions, and Bronsart von Schellendorf served in Kavallerie-Regiment 6. In 1939, he joined the Panzer force and commanded a reconnaissance battalion during the 1940 campaign in France and the 5. Panzer-Division's Panzergrenadier-Regiment 13 during 1942–43 in the Soviet Union. He was awarded the *Ritterkreuz* [Knight's Cross] for leading his regimental staff in a counterattack against a Soviet battalion in July 1943, and the *Eichenlaub* [Oak Leaves] for a rearguard action in January 1944. Leaving the 5. Panzer-Division in early 1944, he attended General Staff school and served on the staff of the 8. Armee before being selected to lead the new Panzer-Brigade 111. Although Hitler viewed officers from the Prussian aristocracy with some misgivings, he sought experienced and aggressive Eastern Front armor commanders to lead his new Panzer brigades in 1944.

Panzer-Brigade 111 was hastily assembled and unable to conduct any unit training before being rushed into battle at Lunéville and Arracourt in mid-September 1944. After days of failed attacks and heavy losses, Bronsart von Schellendorf received a dressing-down by 5. Panzerarmee commander Hasso von Manteuffel during the morning of September 22, just as his brigade was moving to attack



Oberst Heinrich-Walter Bronsart von Schellendorf, the commander of Panzer-Brigade 111, being ordered again into the attack by 5. Panzerarmee commander General der Panzertruppe Hasso von Manteuffel, on September 22. Demoralized by the dressing-down, Bronsart von Schellendorf dismounted to fight with his *Panzergrenadiere* and was mortally wounded later in the day. [NARA]

Juvelize. A break in the clouds allowed USAAF P-47 fighter-bombers to attack the German columns, and a counterattack from the north by tanks from the 37th Tank Battalion engaged the Germans at ranges of 400–2,000yd, destroying 14 Panzers and armored fighting vehicles. Bronsart von Schellendorf dismounted from his command halftrack, joined his *Panzergrenadiere*, and was mortally wounded by machine-gun fire during the action. Some veterans suggested after the war that he may have sought a “soldier’s death” due to exhaustion, the heavy losses suffered by his brigade, and criticism and pressure from senior officers. Bronsart von Schellendorf was posthumously promoted to *Generalmajor*.

ERICH FREIHERR VON SECKENDORFF

Like Bronsart von Schellendorf, Erich Freiherr von Seckendorff was from the Prussian aristocracy. Born on June 21, 1897, he fought in World War I, and was awarded both grades of the *Eisernes Kreuz* [Iron Cross]. He served in the cavalry in the post-1918 Reichswehr and won the *Ritterkreuz* while leading a motorcycle battalion during the campaign in France in 1940. He commanded the 6. Panzer-Division's Schützen-Regiment 114 in the Soviet Union before being posted to Germany to direct the formation of additional *Panzer* units in 1943. Given command of Panzer-

Brigade 113, he also struggled to lead his poorly trained brigade. On September 23 he was killed near La Garde when his command vehicle was strafed by P-47s.

Like Bronsart von Schellendorff, Seckendorff was posthumously promoted to the rank of *Generalmajor*. Manteuffel, the 5. Panzerarmee commander, later praised the commanders of Panzer-Brigaden 111 and 113 for striving to compensate for the new Panzer brigades' poor training and organization with their commitment on the battlefield.

US FORCES AT ARRACOURT

The key US formation during the fighting in the Arracourt area was Major General Wood's 4th Armored Division. Wood's command was organized as one of the 1943 "light" US armored divisions, with a full strength of 15,700 personnel and a balanced organization of three tank, three armored-infantry, and three self-propelled artillery battalions, plus engineer and reconnaissance battalions and other maintenance and supply support units. Brigade-level headquarters, designated combat commands, were assigned different mixes of the division's units depending on the mission. The combat commands were designated CCA, CCB, and CCR (Reserve). Doctrinally, CCR was used to hold units not involved in active operations, although some divisions employed CCR as a third full combat element.

Each tank battalion had three medium M4 medium-tank and one M5 light-tank companies, giving a total of 263 tanks in a full-strength division. Armored-infantry battalions had three companies transported in M3 halftracks although tactical doctrine called for the troops to dismount for combat. Each artillery battalion contained three batteries of 105mm M7 self-propelled howitzers, and the superb US radio network and fire-control systems made the US artillery extremely effective on the battlefield. US artillery firepower was augmented by air support provided by P-47 fighter-bombers of the XIX Tactical Air Command. Air controllers flying light observation aircraft overhead or in specially equipped tanks accompanying the lead units called in airstrikes as needed. US divisions were kept lean organizationally, but in combat typically had additional units attached, with armored divisions usually augmented with a self-propelled tank-destroyer battalion and one or more additional artillery battalions.

As elements of the 4th Armored Division established themselves over the Moselle River in September its forces were near full strength. The division had been able to gain initial combat experience during the pursuit of German forces into Brittany and across France without suffering heavy losses, although tank-vs-tank engagements had been rare during the advance. The 4th Armored Division featured highly capable leaders at all levels. Major General Wood was considered one of the most aggressive

Towed guns continued to be a key part of the US Army's antitank armament in 1944. Here, at Alsdorf-Schaufenberg on October 9, 1944, soldiers from the 823d Tank Destroyer Battalion, 30th Infantry Division, armed with a 3in M5 antitank gun, an M1A1 bazooka, and a .50-caliber M2 HB heavy machine gun, hold a camouflaged defensive position against attacks by elements of the 7. Armee's LXXXI. Armeekorps. (Fred Ramage/Keystone/Hulton Archive/Getty Images)





This overview photo of an M18 of the 827th Tank Destroyer Battalion attached to the 12th Armored Division in December 1944 gives an excellent overview of the open turret, .50-caliber anti-aircraft machine-gun mounting, and unique suspension. Owing to the limited storage space in the small vehicle, M18 crews had to attach their gear to racks on the turret and hull of the vehicle. [Author's collection]

armored commanders in the US military and dubbed “the American Rommel” by the British military historian B.H. Liddell-Hart. CCA, which would be heavily engaged around Arracourt, was commanded by Colonel Bruce C. Clarke, who would go on to lead a combat command of the 7th Armored Division in the critical defense of St. Vith during the Ardennes Offensive. Also prominent was Lieutenant Colonel Creighton W. Abrams, commander of the 37th Tank Battalion, who would drive through German lines to relieve Bastogne in the last days of December 1944.

According to US force-employment doctrine, specialized units such as tank-destroyer, independent tank, anti-aircraft, and artillery battalions were to be held in “pools” at corps or army levels and attached to infantry and armored divisions as needed for specific operations. In action, it rapidly became clear that divisions in combat needed constant support from these battalions, and attaching battalions to the same division allowed them to integrate with the parent unit more effectively. Most infantry divisions received semipermanent support from an attached towed tank-destroyer battalion and armored divisions from M10 or M18 self-propelled tank-destroyer battalions. The 4th Armored Division was fortunate to operate almost continually with the 704th Tank Destroyer Battalion, training with the battalion both in the United States and in Britain before deploying to France.

The 704th Tank Destroyer Battalion was organized under TO&E 18-35, issued in May 1943, and consisted of three tank-destroyer companies each with 12 M18s along with reconnaissance and headquarters companies. The battalion headquarters company had 122 personnel in HQ, staff, communications, maintenance, and transport sections with 25 trucks, a heavy wrecker tow vehicle, three M20 armored cars, and eight ¼-ton jeeps, known as “peeps” in the 4th Armored Division. Self-propelled tank-destroyer battalions included a 126-man reconnaissance company to seek out advancing enemy armor and guide the tank destroyers to firing positions. The reconnaissance company included a total of eight M8 and three M20 armored cars

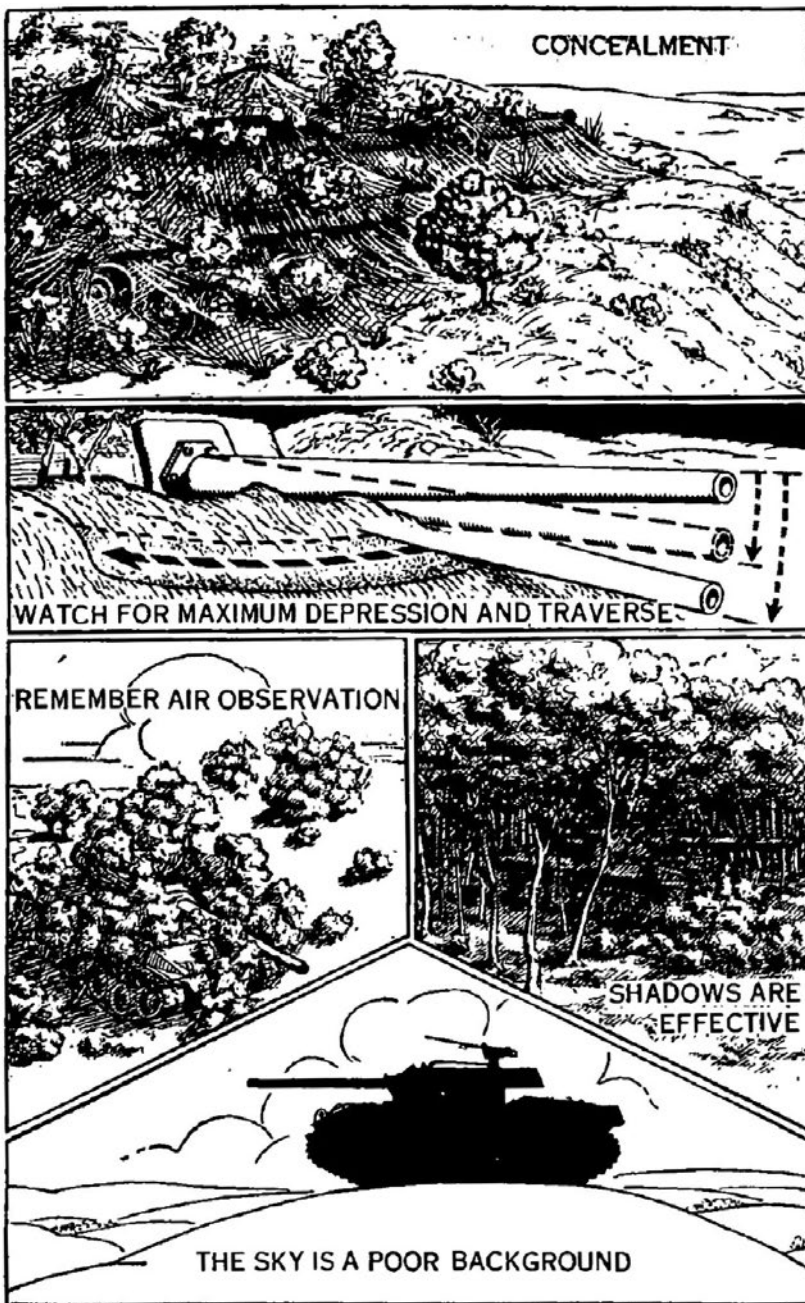
and 18 machine-gun-armed jeeps in its three reconnaissance platoons, the company HQ, and its pioneer (engineer) platoon. The three 135-man tank-destroyer companies had three platoons apiece, each with four M18s. Company HQs were robust and included two M20 armored cars, three jeeps, a 2½-ton truck, and an M32 tank recovery vehicle. The tank-destroyer platoons each included a security section with a jeep and two M20 armored cars along with the four M10s or M18s. The .50-caliber M2 HB heavy machine guns could be dismounted from the M20s and, along with the 2.36in rocket launcher carried in each of the armored cars, provide a close-in defense for the tank destroyers.

US ARMOR TRAINING

US forces were manned by a small cadre of professional officers and troops from the prewar Army leading a massively expanded force of enlistees and draftees. The Reserve Officer Training Corps at colleges and universities and three-month Officers' Candidate Schools provided the large numbers of additional officers needed to lead the force. Enlisted personnel were largely draftees, but strongly motivated for service after the Japanese attack on Pearl Harbor. New personnel were screened for aptitude on induction, with the armored force competing with the US Army Air Forces (USAAF) for personnel with mechanical experience in civilian life. As the units that would fight in France in 1944 were formed in 1941–42, US forces benefited from extensive training both in the United States and Britain before entering combat.

The 704th Tank Destroyer Battalion formed and trained with the 4th Armored Division, the unit it supported during the majority of its time in action. The 4th Armored Division was formed at Camp Pine (now Fort Drum), New York, in April 1941 from a cadre drawn from the 1st Armored Division, and the 704th Tank Destroyer Battalion was formed from the division's Battery D, 22d Field Artillery Battalion, at the same base on December 16, 1941. The 4th Armored Division spent its first months training at Camp Pine while rotating personnel to Fort Knox, Kentucky, for specialist armored training courses. The 704th Tank Destroyer Battalion conducted its initial training with the 4th Armored Division before departing in September 1942 for three months of specialized training at the new Tank Destroyer Center at Camp Hood, Texas. Some of the first US tank-destroyer battalions had to train with improvised equipment – the 628th Tank Destroyer Battalion used simulated weapons for a full eight months before firing a borrowed 75mm gun – and others had to deploy to combat during Operation *Torch* after only weeks training with their tank destroyers. When the 704th Tank Destroyer Battalion arrived, Camp Hood had expanded into a complex establishment able to train full battalions. The Camp Hood tank-destroyer facility eventually included a specialized Officer Candidate School and Individual and Replacement Training centers and at one point was simultaneously training 28 battalions as well as eight tank-destroyer group headquarters.

Unit training was guided by the tank-destroyer doctrine embodied in the June 1942 edition of FM 18-5 *Organization and Tactics of Tank Destroyer Units*. Doctrinally, tank destroyers were to be held in reserve and move aggressively to engage and defeat



A page from FM 18-20 *Tactical Employment of Tank Destroyer Platoon, Self-Propelled*. To compensate for their weak armor, tank-destroyer crews were trained to make extensive use of concealment during field operations and engage enemy tanks from ambush positions. [US Army]

enemy armor once it had broken through US lines. Given their mobility, firepower, and light armor, tank destroyers were to avoid frontal “slugging matches” with enemy tanks but instead gain advantage through mobility and superior observation provided by the tank-destroyer battalion’s organic reconnaissance company. The Tank Destroyer Center had excellent gunnery ranges and the 704th Tank Destroyer Battalion received training in gunnery, fire and maneuver, and single tank destroyer-vs-tank tactics as well as company- and platoon-level operations in concert with armored units.

An M18 crew of the 805th Tank Destroyer Battalion, the only M18-equipped unit to serve in Italy, display their just-delivered Christmas dinner. M18 turret crews, more exposed to enemy artillery and mortar fire, wore steel helmets while the driver and assistant driver wore standard US tank crewman headgear. (Author's collection)



Instructors placed great emphasis on exploiting tank-destroyer agility to maneuver to hit enemy tanks on the suspension systems and side armor, or from the rear. Given the tank destroyer's own light armor, training at Camp Hood placed a strong emphasis on camouflage, cover, and concealment.

One of the distinctive aspects of the Camp Hood training program was the emphasis on offensive spirit and elan. FM 18-5 emphasized individual initiative and aggressiveness, and destroying enemy tanks both at long range, and in "dismounted tank hunting" by crews whose vehicles were disabled. To hone the latter skills, US officers from the Tank Destroyer Center visited Commando training programs in Britain, and established the Tank Hunting Course, later renamed Battle Conditioning, at Camp Hood. The week-long course included training in ambushing enemy tanks and raiding enemy tank parks using small arms, grenades, and improvised weapons such as Molotov cocktails. The course included the first use of live grazing fire overhead on a simulated battlefield in US training and featured a "Nazi village" with booby traps and pop-up targets. Some soldiers considered the tank-hunting training to be melodramatic and impractical, but many regarded the intensive training program as giving them an elite status.

During January–August 1943, the 704th Tank Destroyer Battalion deployed with the 4th Armored Division to the Desert Training Center in California for months of training under field conditions, followed by deployment to Camp Maxey, Texas, for additional physical conditioning and tests that certified the battalion ready for combat. The many months of preparation allowed the 4th Armored Division to train its personnel to be ready to assume the duties of ranks two steps above their own, making it a "division of NCOs" and able to keep functioning despite casualties. On

THOMAS J. EVANS

Thomas J. Evans was born in 1920 in Greensburg, Pennsylvania, and was drafted in March 1941, ten months before the United States entered the war. After basic training he reached the rank of sergeant and led a 17-man 75mm howitzer demonstration team at Fort Knox, Kentucky. He entered Officer Candidate School in May 1942 and joined the 704th Tank Destroyer Battalion at Camp Pine, New York, as a second lieutenant after completing the program. He served with the battalion throughout the war, including its three months of training at the Tank Destroyer Center at Fort Hood, Texas, and ten months with the 4th Armored Division at the Desert Training Center in California. In April 1943, Evans and several dozen other officers from other tank-destroyer battalions were called to a special session in Detroit, Michigan, run by Buick engineers to help design the new M18 tank destroyer. The officers made suggestions about the look and features of the new tank destroyer that were recorded by the Buick engineers and artists in attendance.

CLEO B. WHEELER

Cleo B. Wheeler was drafted in California in February 1942 and received training to be an artilleryman at Camp Roberts, California. He was posted to the newly formed 603d Tank Destroyer Battalion at Fort Lewis, Washington, in May 1942 and would serve with 3d Platoon, Co. C, throughout the war. The 603d Tank Destroyer Battalion initially operated the 75mm M3 halftrack, and the soldiers wore artillery braid on their caps and GHQ patches as the US Army worked out the doctrinal role for the tank-destroyer force. Wheeler and the 603d Tank Destroyer Battalion, still equipped with the M3s, subsequently took the tank-destroyer course at Camp Hood, Texas, breaking several records there. Wheeler was soon promoted to sergeant and led a section of two of the halftrack-mounted guns. The 603d Tank Destroyer Battalion remained at Camp Hood for six months and assisted in the training of tank-destroyer officers. Eventually, Wheeler and the battalion received new T70 tank destroyers, and participated in their field testing, including gunnery, road marches, and crossing water obstacles.

While in England preparing for D-Day, the 603d Tank Destroyer Battalion's commander ordered field modifications to the battalion's M18s so that they could carry 70 rather than the standard 45 76.2mm rounds into action. The battalion operated throughout France and

After the D-Day landings on June 6, 1944, Evans was dispatched to France to select a staging area for the 704th Tank Destroyer Battalion on its arrival in France, but had to wait almost two weeks when the 4th Armored Division's move was delayed by Channel storms. Evans led Co. C, but with its platoons usually attached to various 4th Armored Division units, he noted after the war that he spent most of his time with Colonel Bruce C. Clarke's CCA headquarters.

Evans received the Silver Star for mounting a disabled M18 to engage enemy infantry with the .50-caliber M2 HB heavy machine gun when the battalion's M18s were engaged in clearing Troyes during the Third US Army dash across France. At Arracourt, Evans again mounted a disabled M18 and engaged German tanks by firing off the remaining ammunition in the turret. Evans was soon after appointed to serve as the S-2 (intelligence) staff officer in battalion headquarters. Evans survived the war and returned to Pennsylvania.

Germany with Patton's Third US Army, usually attached to the 6th Armored Division. Wheeler recounted that Co. C only rarely operated as a complete unit in action, and even the platoons often operated in separate two-vehicle sections. As Wheeler's company gave their M18s names that began with C, he dubbed his M18 "Connie." Wheeler served in the advance guard in the 6th Armored Division's drive to Brest during the Brittany campaign and fought at Lunéville where the 6th Armored Division relieved the 4th Armored Division after the initial repulse of the German attack on September 18. Wheeler's section, supported by armored infantry, repulsed a German infantry-tank assault during the fighting around Bastogne on January 4, 1945, with his section tanks "Connie" and "Cheyenne" claiming a total of seven enemy tanks knocked out. Wheeler's tank destroyer never received a large-caliber hit, although he reported bullet holes in his turret armor from enemy small arms, and the two M18s in his section survived from France through Germany and to the end of the war. The 603d Tank Destroyer Battalion reported the highest claims – 90 enemy tanks – of any M18-equipped tank-destroyer battalion. Wheeler settled in California after World War II, worked 21 years at a winery before retirement, and named one of his three daughters Connie, after his wartime M18.

Ultimately, 20 US tank-destroyer battalions equipped with M18s served in Europe during World War II, and three were sent to the Pacific, although only one saw action there. Here, some indigenous men from Espiritu Santo in the New Hebrides are given a ride on an M18 of the 637th Tank Destroyer Battalion. [Signal Corps Archives/ Wikimedia/Public Domain]



February 27, 1944, the men of the 4th Armored Division and the 704th Tank Destroyer Battalion embarked for the 15-day transatlantic voyage to Britain. Stationed in Trowbridge, the 704th Tank Destroyer Battalion was able to conduct four additional months of training exercises with the 4th Armored Division before entering combat, including March training at the excellent British gunnery training facility at Minehead.

As early as 1942, US forces in action found that they did not need to keep tank-destroyer battalions in reserve as the Allies were consistently on the offensive and German armor tended to operate on the defensive in smaller, combined-arm formations. As a result, tank-destroyer battalions were usually attached to various divisions in contact with the enemy, being used to augment the divisional artillery for indirect-fire missions or to support forward tank and infantry units. Infantry divisions were typically assigned towed tank-destroyer battalions, with the self-propelled tank destroyers assigned to armored divisions. In action, the tank destroyers almost never operated as complete battalions, but were assigned in company- and platoon-sized units to provide support for divisional regiments, combat commands, and battalions.

In combat, the M18 commander was positioned to the rear of the gunner in the small turret, under the ring mount for the .50-caliber M2 HB heavy machine gun. The M2 HB was the M18's only secondary armament but was poorly positioned for use in action, and when firing it the tank commander was exposed to enemy fire. The gunner sat to the left of the M1 main gun, monitoring his M4A1 periscopic sight and switching when ordered to the M72C or M76C telescopic sights to line the gun up on a target. The loader was positioned to the right of the main gun, with nine rounds immediately available in the ready rack, and the other 36 located in sponsons in the hull, 18 on each side. An SCR-610 FM radio was in the rear bustle of the turret. The driver sat to the front left of the hull, the assistant driver to the right, and the M18 featured dual sets of driving controls. As the M18 lacked a bow machine gun, the assistant driver had no role in combat, and some M18 units left the position unmanned when entering action.

COMBAT

Hitler earmarked six of the new Panzer brigades for the Vosges Offensive, but the number available soon dwindled to four due to two being sent north to the Netherlands and the Aachen sector. In early September 1944, the 1. Armee defending the Metz area requested immediate reinforcement to launch a spoiling attack against Major General Walker's rapidly advancing XX Corps. Hitler allowed the release of Panzer-Brigade 106 on September 5, but the brigade was to be returned to the reserve after 48 hours.



The radio in this restored M18 bears French labeling, a testament to the multinational use of the vehicle during and after World War II. US wartime tank destroyers used SCR-600 series FM radios, which provided good communication with supporting artillery units but not with infantry AM sets. (Dorling Kindersley: Gary Ombler/Gordon McKenna/Alamy Stock Photo)

MAIRY, SEPTEMBER 8

Panzer-Brigade 106 was one of the first ten Panzer brigades formed, with a single Panzer battalion, the Panther-equipped Panzer-Abteilung 2106, equipped with 36 tanks, 11 Panzerjäger IV/70(V) tank destroyers, and four Flakpanzers. The brigade was well equipped with halftracks to transport its *Panzergrenadier* battalion, but like all the new Panzer brigades had only a reconnaissance company and lacked artillery.

Panzer-Brigade 106 was led by Oberst Franz Bäke, an expert Panzer commander from the Eastern Front, but there was little reliable information about Allied forces in the area and the attack on the village of Mairy was poorly planned. The brigade had 22 operational Panthers available on September 8, with the remainder sidelined by mechanical problems. Bäke formed Panzer-Brigade 106 into two columns and advanced toward the presumed US left flank around Mairy. A close-range firefight erupted when the larger column blundered into the headquarters of the US 90th Infantry Division and the division's nearby artillery command post. Under heavy pressure, the command posts withdrew, and the Germans drove forward to engage elements of the 358th Infantry Regiment in and around Mairy. Like most US infantry divisions, the 90th did not have a self-propelled tank-destroyer battalion with M10s or M18s attached but was supported by the towed 3in antitank guns of the 607th Tank Destroyer Battalion. The towed guns were large and difficult to move, position, and conceal in action against enemy armor, and the battalions with them would be reequipped with self-propelled guns after the Battle of the Bulge. At Mairy, however, several of the 607th Tank Destroyer Battalion's towed 3in antitank guns were able to score close-range hits against the Panthers. The German column was soon trapped amid the streets of the village and the Panthers' long-range tank-killing guns proved less useful in close battle with US infantry armed with rocket launchers, mortars, antitank guns, and M4s from the attached 712th Tank Battalion. By the end of the action, the US forces had lost 11 killed and 60 wounded, most from the command posts, and four M4 tanks. Panzer-Brigade 106 had taken much heavier losses, with 15–19 Panthers destroyed along with 54 halftracks and roughly 100 trucks and other vehicles. In addition, 764 of the brigade's personnel were captured, rendering it combat ineffective.

DOMPAIRE, SEPTEMBER 12

During the second week of September, Major General Haislip's XV Corps was attached to Patton's command and moved forward to protect his right flank and link up with the 6th US Army Group advancing north along the Rhône Valley after its landings on the Mediterranean coast. Haislip, with both the US 79th Infantry Division and the French 2^e Division blindée, was moving into terrain that had been initially designated by German planners as the launching area for the Vosges Offensive, and Hitler again released one of his new Panzer brigades for a spoiling attack. Panzer-Brigade 112 was one of the three new brigades with two Panzer battalions and 90



tanks; but although Panzer-Brigade 112 had the tank strength of a full Panzer division, it began forming only in early September, giving no time for unit training. The Panther battalion, 45 tanks strong, was joined by a 45-tank PzKpfw IV battalion, ten StuG III assault guns, and a two-battalion *Panzergranadier* regiment. Panzer-Brigade 112 was assigned I./PzRgt 29 from the 12. Panzer-Division, and consisted of a cadre of veterans, additional new and poorly trained personnel, and 45 Panthers fresh from the factories. Unlike Panzer-Brigade 106, only trucks were available for Panzer-Brigade 112's two-battalion *Panzergranadier* regiment. Air attacks destroyed seven of the StuG IIIs along with two PzKpfw IVs and five Panthers as Panzer-Brigade 112 was transported by rail to the front. The brigade would collide with the 2^e Division blindée, equipped with M4 tanks, M3 halftracks, and M7 self-propelled artillery guns. Rather than M18s, the 2^e Division blindée's tank-destroyer battalion had 36 of the earlier M10 3in GMC. The French tank-destroyer unit – the Régiment Blindé de Fusiliers-Marins – was unique, as it was manned by volunteers from the French Navy, who continued to wear naval headgear. Charles de Gaulle's son Philippe, an ensign, served with the unit.

The German attack began on September 12, and a battlegroup centered around the Panther-equipped I./PzRgt 29 reached the town of Dompierre, while another element with the PzKpfw IV battalion was outside easy supporting range at the town of Darney. One of the 2^e Division blindée's combat commands with strong air and artillery support, mechanized infantry in M3 halftracks, 40 M4 tanks, and seven M10s engaged the Germans at Dompierre on September 12, with the M10s destroying

A knocked-out Panther Ausf G of Panzer-Brigade 112 in the streets of Dompierre. The fire damage to the rear of the tank suggests a mobility kill, possibly from air attack against the Panther's weak deck armor. (US Air Force)

OPPOSITE

An M18 from the 603d Tank Destroyer Battalion guarding a street in Lunéville, during the Arracourt battles in September 1944. The crew appear to have dismounted the turret .50-caliber M2 HB heavy machine gun. (US Army)

and damaging several Panthers that exposed their side and rear armor while withdrawing. Other French M4s and M10s pulled back, however, as they saw their 75mm and 3in rounds bouncing off the frontal armor of the Panthers. The next day, the 2^e Division blindée called in artillery and airstrikes by rocket-firing P-47s to pin down I./PzRgt 29 in Dompaigne. Some of I./PzRgt 29's tanks were lost to the strafing and rocket runs, and more as they attempted to launch probes to find an escape route and were hit by M4s and M10s from ambush positions blocking the roads. French units blocked relief attempts by the PzKpfw IV battlegroup and elements of the 21. Panzer-Division. By nightfall the Panzer-Brigade 112 survivors withdrew from Dompaigne. The action had reduced Panzer-Brigade 112's strength from 90 to only 21 operational tanks and cost about one-third of its manpower. As for I./PzRgt 29, it had been particularly hard hit and ended the battle with only four surviving Panthers along with another four that had been under repair. Hitler's planned force of Panzer brigades for the Vosges Offensive had now been reduced to two.

After the failure of the spoiling attacks, the 4th Armored Division crossed the Moselle River despite stiffening German resistance, encircled and captured Nancy, and prepared for a further advance through Lorraine toward the Rhine. On September 16, Hitler issued revised orders for the Vosges Offensive, now aimed at cutting off and destroying the 4th Armored Division. Frustrated with days of command confusion and delays, he peremptorily ordered that the offensive begin on September 18 with whatever forces were available. The terrain in the area was generally rolling, with scattered woods and villages, and the weather typically overcast and rainy, with fog, particularly in the morning hours. The cloudy weather gave the attacking Panzer brigades cover from US air attack, but the fog led to close-range engagements, robbing the Panthers of their long-range fire superiority over the 4th Armored Division's M4s and M18s.

One of Panzer-Brigade 112's Panthers knocked out in Dompaigne on September 12. The Germans were isolated in the Dompaigne area and under heavy air attack, and took heavy losses at the hands of the French 2^e Division blindée. (Unknown/Wikimedia/Public Domain)





LUNÉVILLE, SEPTEMBER 18

The 5. Panzerarmee began its attack north to cut off the 4th Armored Division from the Moselle River on September 18, as per Hitler's orders. Manteuffel ordered XLVII. Panzerkorps to attack northwest and seize Lunéville with Panzer-Brigade 111 and 21. Panzer-Division while LVIII. Panzerkorps advanced against the town along with Panzer-Brigade 113 and 15. Panzergrenadier-Division. In the event, the movement to contact by the weak 21. Panzer-Division was halfhearted, and the columns of Panzer-Brigade 113 and 15. Panzergrenadier-Division were recalled north before engaging due to inaccurate reports that Lunéville was already captured. Only Panzer-Brigade 111 was able to engage US forces during the first day of the offensive.

The Third US Army's 2d Cavalry Group, commanded by Colonel Charles H. Reed, had established a series of outposts on the roads to the south of Lunéville and Combat Command Reserve (CCR) of the 4th Armored Division had units just north of the town. During the early-morning hours of September 18, two Panzer-Brigade 111 battlegroups encountered light vehicles of the US cavalry outposts. The cavalry's tanks were no match for the columns' Panthers and four M5A1 light tanks and six M8 75mm Howitzer Motor Carriages (HMCs) were destroyed. The commander of the engaged 42d Cavalry Reconnaissance Squadron, Major James H. Pitman, was killed in the action and Colonel Reed severely wounded, although the cavalrymen, fighting dismounted, delayed Panzer-Brigade 111's advance for several hours.

CCR had established its main defensive line north of Lunéville, but on receiving word of the German attack sent an M4 medium-tank platoon and a platoon from Co. B, 704th Tank Destroyer Battalion, through the town to back up the cavalry. Co. B's four M18s took up position and opened fire on eight advancing Panthers

OVERLEAF

The 5. Panzerarmee's Vosges Offensive began on September 18 with elements of Panzer-Brigade 111 advancing against Lunéville. After several hours battling through the 42d Cavalry Reconnaissance Squadron's screen, Panthers of Panzer-Brigade 111 approached the four M18 Hellcats of Co. B, 704th Tank Destroyer Battalion. Catching the Panthers unawares, the M18s destroyed two of the German tanks, causing the others to begin to reverse down the road. Lieutenant Richard Buss identified a Panther about 325yd away and ordered Sergeant Romek's M18 to maneuver to engage the German tank's weaker side armor. The gunner signaled that the first round was a hit, but as the Panther appeared undamaged Romek ordered another to ensure that the target was knocked out, resulting in the Panther beginning to burn.







A knocked-out Panther from I./PzRgt 130 of Panzer-Brigade 113. Both Panzer-Brigaden 111 and 113 lost most of their tanks in just a few days of intense fighting with the US 4th Armored Division. [© CORBIS/Corbis via Getty Images]

moving across a small bridge over rail tracks. One M18 was able to maneuver to fire against the tanks' side armor and disabled two Panthers from the column. The platoon commander, Lieutenant Richard H. Buss, identified another Panther about 325yd behind the rail tracks with its vulnerable side visible and ordered an M18 commanded by Sergeant Alexander Romek to engage. Romek fired several rounds into the Panther, destroying it. *Panzergrenadiere* from the German column began to advance around the burning Panthers, and the M18s withdrew back into Lunéville due to a lack of infantry support. CCR soon requested reinforcements, and Colonel Clarke dispatched Task Force Hunter, consisting of a tank and armored-infantry company, an artillery battery, and elements of Co. C, 704th Tank Destroyer Battalion, from CCA to Lunéville. Fighting continued throughout the day, with CCR making effective use of artillery support by shelling the road junctions leading to the town. None of the 704th Tank Destroyer Battalion's M18s were hit during September 18, and its crews claimed a total of nine Panthers destroyed during the day. The battalion commander, however, Lieutenant Colonel William A. Bailey, was killed by German mortar fire while directing operations. A subsequent US intelligence report estimated that Panzer-Brigade 111 had lost a total of 12 Panthers and ten PzKpfw IVs during the unsuccessful attack.

Neither side's senior leadership had a clear picture of the results of the first day of the offensive. Manteuffel and Blaskowitz were informed that Lunéville had been secured by 1400hrs and Panzer-Brigaden 111 and 113 were directed to move north and attack Arracourt. On the other side, US commanders viewed the action as a local attack, and unaware that a major German offensive was underway, Patton and Wood ordered the 4th Armored Division to begin its advance toward the Rhine on September 19. The 6th Armored Division and its attached M18-equipped 603d Tank Destroyer Battalion were ordered to take over the defense of Lunéville, allowing Wood to gather his full division for the advance. The stage was set for the largest clash of US and German armor in the ETO to date, as Manteuffel's 5. Panzerarmee launched its Panzer brigades directly against Arracourt, where CCA of the 4th Armored Division was preparing to resume its advance toward Germany.

ARRACOURT, SEPTEMBER 19

Although Manteuffel ordered his forces to launch a concentrated attack on Arracourt, the Panzer offensive degenerated into several days of disjointed attacks against the 4th Armored Division. On September 19, Panzer-Brigade 111 was still disengaging from the Lunéville fighting, and, misdirected during its road march by a French farmer, only reached the battlefield late in the day. The morning attack was left to Panzer-Brigade 113 and, covered from air attack by fog, 42 Panthers and Panzergrenadier-Regiment 2113 led the main thrust against Arracourt while another battlegroup moved toward the town of Lezey to the north. CCA had been weakened by the detachment of Task Force Hunter to Lunéville the day before but retained most of the 37th Tank and 53d Armored Infantry battalions, three artillery battalions, and platoons from Co. C, 704th Tank Destroyer Battalion.

The advancing German armored column was spotted emerging from the fog by a 37th Tank Battalion liaison officer, Captain William A. Dwight, as he transited the area east of Arracourt in his jeep. After radioing a warning to the 37th Tank Battalion commander, Lieutenant Colonel Abrams, Dwight drove on to alert CCA. Colonel Clarke directed Dwight to lead his headquarters guard force, the 3d Platoon, Co. C, 704th Tank Destroyer Battalion, to take position on Hill 279 east of Arracourt near the town of Rechicourt-la-Petite. Dwight and platoon commander Lieutenant Edwin T. Leiper led the four M18s to the hill in their jeeps. On arrival at Rechicourt, the well-trained M18 crews quickly dispersed into a line formation when a PzKpfw IV emerged from the fog, and rapidly destroyed the German tank. The fire from the burning PzKpfw IV revealed additional Panzers in the fog moving toward the Americans in a “V” formation. After an exchange of fire, five PzKpfw IVs were destroyed and Sergeant Emilio Staci’s M18 was hit in return. Staci’s assistant driver,



A view of the turret compartment of a restored M18. The desire to keep the M18 light, highly mobile, and with a low profile entailed a very cramped turret. The commander sat below the .50-caliber M2 HB heavy machine gun ring mount, with the gunner in front of him, and the loader in the right side of the turret in front of a compartment of nine “ready rounds.” The 76.2mm main gun was mounted at a 45-degree angle to allow the loader enough space to place shells in the breech. (Dorling Kindersley: Gary Ombler/Gordon McKenna/Alamy Stock Photo)

Private Richard F. Graham, was killed and the rest of the crew wounded, but the damaged M18 was able to withdraw to the rear under its own power. Later in the morning, Leiper's remaining three M18s engaged additional formations of German tanks, aided by signals from a 4th Armored Division L-4 light observation aircraft flown by Major Charles Carpenter, known as "Bazooka Charlie" for strapping bazookas under the wings of his L-4. In these exchanges, two additional M18s were damaged, and Leiper pulled his remaining M18 back to the reverse slope as crews from the disabled M18s salvaged the vehicles' .50-caliber M2 HB heavy machine guns and used them to secure the position. In total, three M18s had been put out of action in return for nine PzKpfw IVs destroyed.

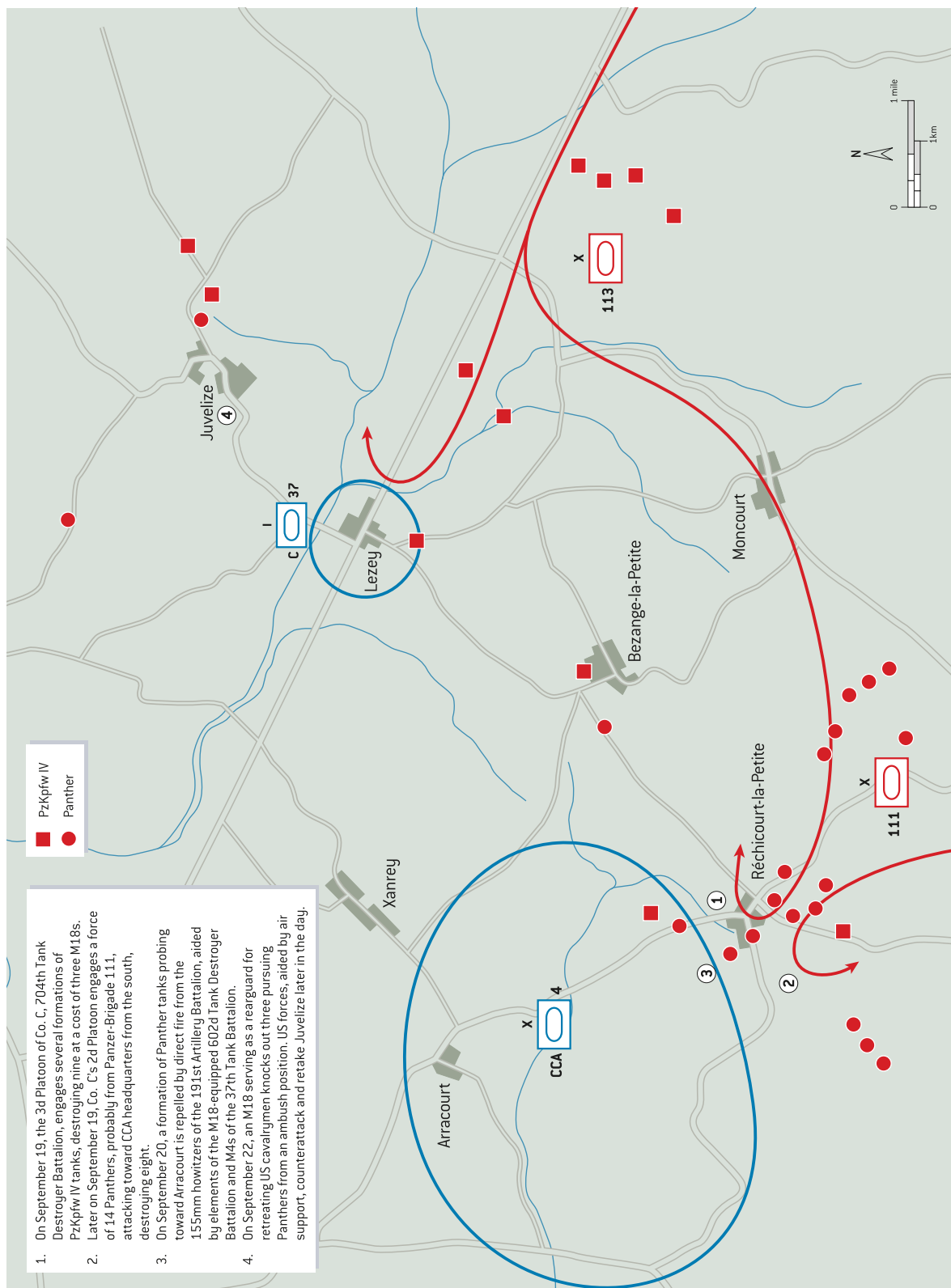
The German attack developed into a series of probes and attacks over the course of the day as companies of tanks accompanied by *Panzergranadiere* repeatedly tried to penetrate CCA's defenses. The superior mobility of the M4s and the remaining M18s allowed them to outmaneuver the Panthers and PzKpfw IVs and hit their vulnerable side armor. Leiper's surviving M18 from the initial engagement was ordered to join the 2d Platoon of Co. C, and around noon, while positioned south of Arracourt to guard CCA headquarters, the company commander Captain Thomas J. Evans spotted an enemy force of 14 Panthers, likely from the late-arriving Panzer-Brigade 111, attempting to penetrate US lines by advancing south of the town. The M18s were positioned on higher ground and able to target the Panthers' flanks, destroying eight and forcing the survivors into a hasty withdrawal. Later in the afternoon, as reinforcements arrived, the US forces had enough resources for a counterattack. Task Force Hunter, with the M4s of the 37th Tank Battalion, advanced from the north through German positions, surprising the stalled enemy tank units and destroying an additional nine Panthers at the cost of three M4s.

Lieutenant General Patton arrived at the 4th Armored Division headquarters to consult with Wood during the evening of September 19. US forces reported as many as 42 enemy tanks, including numbers of new Panthers straight from the factory, destroyed during the day's fighting. The 4th Armored Division had suffered six personnel killed in action and 13 wounded. The aggressive US commanders decided that German forces in the area must be spent, and Patton ordered a renewed push by CCA toward the Rhine the next day. The German attack on September 19 had been a costly failure, and the 5. Panzerarmee was again unable to coordinate operations by Panzer-Brigaden 111 and 113. The Panzer brigades' lack of adequate reconnaissance assets and artillery were telling, but despite the heavy losses, Heeresgruppe G demanded the offensive continue.

ARRACOURT, SEPTEMBER 20

Colonel Clarke's CCA was heavily reinforced for the planned attack northeast toward the Rhine on September 20, and now controlled two tank, two armored-infantry, and two self-propelled artillery battalions, organized in two task forces. Despite Blaskowitz's urgent order that the 5. Panzerarmee continue the attack, Manteuffel decided to use September 20 to consolidate the two Panzer brigades in positions to the southeast of

OPPOSITE: The map shows the position of US forces and German offensive moves on September 19. On September 20, US forces began to advance toward the northeast when German attacks along similar axes as the day before by Panzer-Brigaden 111 and 113 caused the 4th Armored Division units to return and engage the Germans. On September 22, US forces repulsed another German armored thrust against Juvelize. The circles and squares on the map indicate the locations of knocked-out German tanks surveyed in November 1944.



Arracourt, but ordered the brigades to conduct a series of small-scale offensive jabs to satisfy higher headquarters. A sortie by *Panzergranadier*-carrying Panthers emerged from the fog and approached the 191st Field Artillery Battalion near Arracourt during the morning hours and was met with close-range fire from the US battalion's 155mm M114 towed howitzers. Elements of the M18-equipped 602d Tank Destroyer Battalion, attached to the 2d Cavalry Group, and M4 medium tanks from Co. A, 37th Tank Battalion, helped repel the Panthers. Receiving word of the German tank probes to the south, Clarke recalled the advancing CCA task forces and decided on a large-scale sweep of the presumed positions of the Panzer brigades. A series of close-range tank engagements ensued, with both sides losing 10–12 armored fighting vehicles as the US columns battled south through the German lines. The Panzer brigades' performance on the day had again been lackluster, and Hitler seized on the lack of progress as an excuse to relieve Blaskowitz of command of Heeresgruppe G on September 21. General der Panzertruppe Hermann Balck, like Manteuffel a successful Panzer commander from the Eastern Front, was appointed to take over. The change of commanders led to a day of relative inactivity on September 21, used by the 4th Armored Division for rest, maintenance, and replenishment.

On September 22, the Germans returned to the attack, with the 5. Panzerarmee now ordering Panzer-Brigade 111 to attack from the north toward Juvelize, while a Panzer-Brigade 113 battlegroup moved due west against Lezey. Approaching again in morning fog, the Panthers and PzKpfw IVs of Panzer-Brigade 111 encountered cavalry outposts from the 4th Armored Division's 25th Squadron near Juvelize and destroyed four M5A1 light tanks. Lieutenant Martin Evans' 2d Platoon, Co. B, 704th Tank Destroyer Battalion, was protecting the outpost line's left flank. When the cavalrymen began to withdraw past his M18s, Evans ordered his M18s to pull back leaving one in its hull-down position as a rearguard. The executive officer of the battered cavalry ordered the rearguard tank destroyer to engage the approaching Panthers, now about 600yd away. Firing from ambush, the M18 hit three of the Panthers before withdrawing.

One of Panzer-Brigade 106's Panther Ausf Gs abandoned during the retreat from Mairy. US troops have mounted a sign on the Panther to help passing troops with vehicle recognition. The US troops here from the 5th Infantry Division are preparing the Panther for removal in December 1944. [© CORBIS/Corbis via Getty Images]





US forces soon mounted a counterattack as breaks in the clouds allowed P-47 fighter-bombers to engage the German columns and Lieutenant Colonel Abrams of the 37th Tank Battalion took advantage of the improving weather to lead an infantry-tank force with artillery support to secure Juvelize. German forces lost a total of 14 tanks on September 22 and the commander of Panzer-Brigade 111, Oberst Heinrich-Walter Bronsart von Schellendorf, exhausted from days of chaotic battle and little sleep, and having just received a dressing-down from Manteuffel, dismounted from his command halftrack to lead his troops personally and was mortally wounded by machine-gun fire. Bronsart von Schellendorf's body was found by German forces four days later, next to a dead *Panzergrenadier*. The commander of Panzer-Brigade 113, Oberst Erich Freiherr von Seckendorff, would be killed in action the next day when his command halftrack was strafed by a P-47.

By nightfall, Panzer-Brigade 111 could muster only seven of its original 90 tanks and 80 *Panzergrenadiere* ready for operations. Frustrated with the Panzer brigade's heavy losses and battlefield ineffectiveness, Manteuffel integrated the remnants into his existing *Panzer* and *Panzergrenadier* divisions. The 5. Panzerarmee continued to attack until the end of September, but the assault shifted to the northern portion of the US salient and was now led by the 559. Volksgrenadier-Division and the weakened *Panzer* and *Panzergrenadier* divisions. The 4th Armored Division, joined by elements of the 35th Infantry Division, transitioned to a positional defense on September 26. The German attacks now relied on infantry and artillery given their large tank losses. Clearing weather allowed for increased USAAF air activity over the battlefield, and the German high command formally ended the Vosges Offensive on September 29. The 4th Armored Division was now in dire need of a period for rest and maintenance, and the Third US Army, again short of supplies, moved temporarily to a defensive posture.

Panther Ausf Gs of Panzer-Brigade 111 marshaling for the German attack on September 20. Within hours, these tanks would be heavily engaged with US tanks from the 4th Armored Division. [NARA]

PANTHER GUNSIGHT VIEW



A view of M18s through a Panther's gunsight. The Panther gunner lacked a periscope for situational awareness, and had to acquire the target in his "soda-straw" TFZ12a monocular telescope when directed by the tank commander, a process that could take up to 20 seconds. The markings around the periphery of the scope allowed the gunner to adjust for the use of the coaxial machine gun or the type of round being fired from the main gun. The apex above the larger triangle in the center of the scope was the

aiming point, and an experienced gunner could estimate range by comparing the size of the target with the size of the triangle. The smaller triangles on either side used to aid the gunner in estimating movement when trying to engage a moving target. Effective use of these techniques under the strain of battle required extensive training and practice, lacking in many of the Panther crews engaged at Arracourt in 1944.

M18 HELLCAT GUNSIGHT VIEW



The view through the M18's gunsight. The Hellcat's gunner had an M4A1 periscope for general battlefield orientation, and when engaging a target switched to the M72C or M76 direct-sight telescope for aiming. The vehicle commander would give the gunner the estimated range to the target, and the gunner would use the reticle's markings, delineated

in yards, to elevate the gun properly. At Arracourt, many engagements took place at relatively close ranges, giving the M4 Sherman and M18 Hellcat better chances against the attacking Panzers while denying the Panther its exceptional long-range tank-killing capability.

STATISTICS AND ANALYSIS

Hitler's Vosges Panzer Offensive had been decisively defeated although the offensive succeeded in derailing the Third US Army's plans to advance on the Rhine in September. Of the 616 German tanks and assault guns dedicated to the attack, 118 Panthers, 101 PzKpfw IVs, and 221 assault guns and other armored fighting vehicles had been lost; another 148 were damaged and under repair. The Third US Army lost 45 M5A1 light and 151 medium tanks and tank destroyers in September but received 392 replacements. Hitler's grand design had been so poor in execution, with piecemeal commitment of worn-down divisions and new, poorly trained Panzer brigades, that Patton's troops were slow to realize a major offensive was underway. Postwar accounts of September 1944 often focus on the strategic debates among the Allied high command and the drama of the Operation *Market-Garden* airborne operation and pay events in Lorraine little attention. While defeated, the Vosges Offensive did derail the 4th Armored Division's plans to drive eastward in September, and along with supply shortages and the stalwart defense of the Metz fortifications, caused Patton's advance through Lorraine to come to a halt in October.

The 4th Armored Division and its attached units, including the 704th Tank Destroyer Battalion, outfought the 5. Panzerarmee throughout the battle. The 4th Armored Division was a capable combined-arms team and met the attackers with M4s and M18s manned by well-trained crews along with superb artillery and, when the weather allowed, strong air support. US commanders were agile, and despite being struck on the flank while trying to resume their advance on the Rhine, reacted quickly to each attack, plugging gaps and counterattacking in turn when German columns



emerged from the fog. Although numerically superior on paper, Manteuffel's forces were never able to mount a coherent attack. Panzer-Brigaden 106 and 112 were destroyed in ill-considered spoiling attacks. The 3. and 15. Panzergrenadier-Divisionen, newly arrived from Italy, had already suffered losses trying to prevent the Third US Army from crossing the Moselle, and the 11. and 21. Panzer-Divisionen had already suffered major losses before the offensive began. Panzer-Brigaden 111 and 113 were committed to action close to full strength but had been hastily assembled and poorly trained, and were unable to launch a powerful, concentrated assault on Lunéville on September 18 and Arracourt on the 19th and 20th.

The M18s of the 704th Tank Destroyer Battalion made a major contribution to the 4th Armored Division's tactical success. While US tank destroyers were more typically employed during the war in infantry and indirect-fire support roles, the clash at Arracourt gave the M18s the opportunity to fulfill their intended role against an enemy tank attack. Rather than being massed in a corps-level tank-destroyer reserve, however, the companies and platoons of the 704th Tank Destroyer Battalion were dispersed among the 4th Armored Division's combat commands. The battalion reported destroying 37 enemy tanks – a mix of Panthers and PzKpfw IVs – two assault guns, one towed 8.8cm antitank gun, and seven other enemy vehicles in September. The battalion suffered in turn four M18s totally destroyed and three damaged. One M20 armored car was also lost, and the battalion suffered three officers and ten

An M18 knocked out during the Battle of the Bulge. Although they did not operate as per formal doctrine as a massed reserve, US tank-destroyer battalions operated in platoon- and company-sized elements in support of US armored and infantry forces halting and counterattacking the German offensive. The vulnerability of towed tank-destroyer battalions in the Ardennes fighting led to the battalions being reequipped with self-propelled tank destroyers after the battle. [Author's collection]

enlisted killed and three officers and 42 men wounded in action. Technically, the Panthers of Panzer-Brigaden 111 and 113 should have dominated their M4 and M18 opponents due to their superior frontal armor protection and long-range tank-killing main gun, but the 704th's well-trained crews repeatedly surprised, outmaneuvered, and outshot the Panthers and PzKpfw IVs they faced. The engagements often began in conditions of early-morning fog and rain, and the attacking Panzers repeatedly stumbled upon M18s, resulting in close-range engagements that kept the Panthers from exploiting their long-range fire superiority. When surprised by US fire, the German columns would stall and, as the Panzers attempted to retire often gave the M18s opportunities to hit their vulnerable sides.

The Panthers, along with the PzKpfw IVs and other German armored fighting vehicles committed to the Vosges Offensive, performed poorly. The new Panzer brigades had inadequate command staffs and communications equipment, only a small reconnaissance element, and no artillery. The brigades advanced with little knowledge of US positions and, although the Panthers and PzKpfw IVs could brush aside the M5A1 light tanks of US cavalry outposts, repeatedly blundered into M4 and M18 ambushes at close range in the foggy and rainy conditions typical of the battle. The German crews appear to have attempted to back up or turn when taken under fire, exposing their vulnerable side armor to the M4s and M18s. Numbers of German tanks, probably mostly PzKpfw IVs but apparently including some Panthers, were disabled by M18 frontal fire. The PzKpfw IV's frontal armor could be penetrated from the front at close range; Panthers knocked out by 76.2mm frontal fire may have had a track disabled, a shell ricochet off the gun mantlet into the forward driver's compartment, or may have been abandoned by inexperienced crews when the tank was hit. When stopped at first contact, the Panzer brigades were unable to bring up supporting arms to dislodge US armor, as they lacked any artillery, and their *Panzergrenadier* battalions were ill-trained and often mounted in commandeered civilian trucks rather than armored halftracks. The US forces, however, could add capable infantry to the defensive mix and bring down heavy artillery fire, joined when the weather cleared by airstrikes by fighter-bombers, on the stalled Panzer columns. The operational tank strength of Panzer-Brigaden 111 and 113 precipitously declined during the Vosges Offensive. Two weeks after the two Panzer brigades began their attacks with a total of 180 Panthers and PzKpfw IVs, they only had 29 total operational tanks between them.

Operational tank strength, Panzer-Brigaden 111 and 113, September 10–24, 1944

	September 10	September 20	September 21	September 22	September 24
Panzer-Brigade 111					
Panther	45	18	10	3	4
PzKpfw IV	45	13	11	4	6
Panzer-Brigade 113					
Panther	45	4	6	5	10
PzKpfw IV	45	19	13	14	9
Total	180	54	40	26	29

AFTERMATH

Although its mechanical limitations meant that it would have been less capable of the long-range offensive operations that the Wehrmacht had conducted in 1939–42, the Panther was optimized for tank-vs-tank fighting and was well suited to the strategic defensive operations Germany conducted during the last years of World War II. The Ausf G was the final mass-production model of the Panther and along with surviving Ausf As and small numbers of the original Ausf Ds battled to the end on both fronts. Panther Ausf Gs produced in later 1944 and 1945 featured the “chin” on the mantlet to prevent shots from deflecting down into the driver’s compartment, but were without *Zimmerit*, as it was reported to be flammable.

The summer 1944 Panzer brigades rapidly melted away in battle and soon, almost all were merged into various Panzer divisions. Several months of Panther production had not been sent to understrength but experienced Panzer divisions, organized and trained for combined-arms operations; instead the new tanks were squandered in hastily formed tank-heavy brigades that accomplished little.

The Panther was a major presence during the last major German offensive in the West in the Ardennes, but confined to narrow, icy roads the tank turned in a mixed performance. Losses to the US defense and counterattacks were heavy, and by the end of December 1944, 180 of the original 415 Panthers committed to the fighting had been lost. Reliability problems continued to impact the Panther’s combat performance, and only 45 percent of the remaining tanks were operational. For the remainder of the war, the long 7.5cm main gun of the Panther would continue to inflict painful casualties on attacking Allied tanks in rearguard actions on both the Eastern and Western fronts, but overall performance was weakened by the deterioration of German industrial capacity and the declining quality of crew training. By the end of the Third Reich, 5,943 Panthers, including 350 command variants, had been produced. Some

<i>Panzer-Brigade outcomes, 1944–45</i>				
Brigade	Front	Major action	Disbanded	Absorbed by
101	Eastern	Latvia	November 1944	20. Panzer-Division
102	Eastern	Poland	November 1944	7. Panzer-Division
103	Eastern	Poland	November 1944	5. Panzer-Division
104	Eastern	Poland	November 1944	25. Panzer-Division
105	Western	Aachen	November 1944	9. Panzer-Division
106	Western	Lorraine	April 1945	Remained a brigade
107	Western	<i>Market-Garden</i>	November 1944	25. Panzergrenadier-Division
108	Western	Aachen	October 1944	116. Panzer-Division
109	Eastern	Hungary	November 1944	Panzer-Division <i>Feldherrnhalle</i>
110	Eastern	Hungary	September 1944	13. Panzer-Division
111	Western	Lorraine	October 1944	11. Panzer-Division
112	Western	Lorraine	September 1944	21. Panzer-Division
113	Western	Lorraine	October 1944	15. Panzergrenadier-Division

of the last Panther Ausf Gs produced were delivered from the Daimler-Benz factory in Berlin and rushed directly to troops defending the German capital in late April 1945.

Despite its World War II reputation, the destruction of German's industrial base and its division among the victorious Allies meant that only a small number of Panthers served after 1945, with about two dozen used by the French and Belgian armies. The legacy of the Panther was stronger in postwar tank design. Impressed by the Panther's strong frontal armor and lethal main armament, the Soviet Union and Western Allies all pursued designs – beginning with the Soviet T-54, the US M26 Pershing, and the British Centurion – aimed at fielding a main battle tank with the Panther's protection and firepower but with better reliability.

In terms of tank kills, the M18 was the most effective US tank destroyer of World War II, with a higher kill-to-loss ratio than any other tank or tank destroyer fielded by US forces. Kills claimed were 526 in total: 498 in Europe, 17 in Italy, and 11 in the Pacific. The kill-to-loss ratio for Europe was 2.3:1, and the overall kill-to-loss ratio was 2.4:1. Despite its success in its intended role, however, the M18 and other tank destroyers were much more frequently employed in infantry-support duties, and the M18 had major limitations in this role. The M18's light armor, open turret, and lack of coaxial and bow machine guns limited its utility and made it extremely vulnerable when backing up attacking US infantry. As a result, tank destroyers were often held farther back from the firing line, providing overwatch fire support.

Most M18-equipped tank-destroyer battalions were used in Europe, with eight fighting in the ETO in 1944, joined by a further 12 in 1945. Seven of the new 1945 tank-destroyer battalions originally equipped with towed 3in antitank guns converted to the M18 after the poor performance of towed weapons during the Battle of the Bulge. Three M18-equipped tank-destroyer battalions were heavily engaged in the Ardennes, notably the 705th Tank Destroyer Battalion, which reported 43 Panthers destroyed when attached to the 101st Airborne Division during the defense of



A Panther Ausf G of Panzer-Brigade 111 about to launch an attack on elements of the 4th Armored Division defending the area around Arracourt, September 20, 1944. The Panthers typically carried *Panzergranadiere* into battle during Germany's Vosges Offensive in Lorraine. (NARA)

Bastogne. The 704th Tank Destroyer Battalion's M18s accompanied the 4th Armored Division during its difficult attack to relieve the encircled paratroopers. One M18 battalion, the 805th Tank Destroyer Battalion, served in Italy.

Ten self-propelled tank-destroyer battalions were sent to the Pacific Theater of Operations, but the lack of a significant Japanese armor threat and the vulnerability of tank destroyers with their open turrets to close attack made them unpopular. When used, the tank destroyers were kept well back with strong infantry protection and supported advancing units with fire. Three were M18-equipped tank-destroyer battalions, but only one was used in combat operations. The M18-equipped 637th Tank Destroyer Battalion was used on Luzon in the Philippines and provided effective fire support in the battle for Manila and against Fort McKinley.

Major General Bruce of the Tank Destroyer Center became commander of the US 77th Infantry Division in the Pacific and secured 18 M18s to augment his organic antitank capabilities. Bruce also experimented with more uses for the M18, including replacing the towed 57mm antitank guns in the regimental antitank companies, but the war ended before any such ideas could be implemented. Studies on the use of M18s to destroy bunkers in the planned final invasion of the Japanese home islands determined that the M36's 90mm M3 gun would be more effective.

The original US plans to produce 1,000 M18s in 1943, 3,600 in 1944, and 4,386 in 1945 were soon reduced. A total of 1,000 M18s had been allocated for Lend-Lease, but neither Britain nor the Soviet Union were interested. In the ETO, the inadequacy of the M18's 76.2mm gun against the Panther led to the fielding of the M36 in the tank-destroyer role, which combined the M10 chassis with a turret modified to carry the 90mm M3 gun. Various measures were considered to improve the M18, with top turret cover, better armor, and a 90mm "super Hellcat" design, but none were implemented. As a result, M18 production was reduced to a total of 2,507, with 1,850 fielded in the tank-destroyer configuration, and 650 as M39 and T41E1 utility

vehicles. Bruce had recommended the M18's employment as a light tank, but studies rejected the concept in favor of the new M24 Chaffee light tank due to the M18's thin armor and lack of a coaxial machine gun.

The initial plans to form over 200 tank-destroyer battalions were steadily reduced during World War II as it was realized that the original doctrine did not address the reality of combat against the German Army in 1943–45. By the end of 1943, the US Army decided to limit the force to 106 battalions. Of these, 61 fought in Europe, ten were sent to the Pacific, and due to a lack of call for their services the remaining 35 were reorganized as artillery, amphibious tractor, or tank battalions before deploying.

A review of combat operations confirmed that most tank destroyers were overwhelmingly utilized for indirect-fire and infantry support. Even when tank destroyers were able to fulfill their primary role by engaging enemy armor, weaker armor protection put the tank destroyers at a major disadvantage, and the US Army now confirmed that the tank was the best weapon for use against enemy tanks. As a result, US lessons-learned studies recommended the dedicated tank-destroyer concept be abandoned, and the tank-destroyer force was disbanded soon after the end of World War II. Postwar divisional tables of organization added a heavy-tank battalion to the

An M18 of the 704th Tank Destroyer Battalion crosses a bridge over the Moselle River, March 15, 1945. This M18 has the original 76.2mm M1 main gun without the muzzle brake added to later models to reduce the gun's backblast, which obscured the fall of shot for the crew. The small size of the M18 forced the crew to store their gear on the exterior of the vehicle. (NARA)





US Army infantry division, while each infantry regiment's 57mm antitank-gun company was replaced with a medium-tank company. Armored divisions received additional tank and armored-infantry battalions, eliminating the wartime reliance on drawing units from pools held at corps and army levels to strengthen units.

Despite the US Army's changes in doctrine and structure, M18 and M18-related vehicles continued to operate after 1945. Of the 684 M18s returned to Buick for rebuilding due to initial production problems, 640 were rebuilt as M38 and T41/T41E1 utility vehicles. These were originally intended to operate with the new towed 3in tank-destroyer battalions formed in 1944, but few were sent to the ETO as these battalions rapidly shifted to a self-propelled organization after the Battle of the Bulge. M39s were, however, extensively employed during the Korean War, both for logistical transportation and as troop carriers despite their thin armor and open turret top. Other M39s were locally modified to carry antiaircraft guns or mortars.

M18s were employed in limited numbers in Europe, South America, and Asia after World War II. Italy received 107 M18s and Greece 127. Iran received 55 M18s during the 1950s, and Venezuela purchased 40 in 1954. Chiang Kai-Shek's Nationalist Chinese forces received 214 M18s, some of which were evacuated to Taiwan where they served for several decades. Rather than serving in separate tank-destroyer units, M18s were used there in place of tanks in armored divisions. Owing to embargos, Taiwan retained any armored fighting vehicles as long as possible and some M18 turrets were mounted on M42 Duster self-propelled antiaircraft gun chassis when their own became unusable. M18s were engaged in combat operations as late as the 1990s. Yugoslavia received 214 M18s as part of the US Military Defense Assistance Program, and numbers were used by Serb, Croatian, and Bosnian forces during the conflicts of the 1990s.

An M36 tank destroyer in Metz, November 1944. Owing to the inability of the M10 and M18 to penetrate the frontal armor of both the Panther and Tiger, the US Army investigated placing a 90mm main gun on an M18 chassis but chose instead to deploy increasing numbers of the M36, which had the 90mm M3 gun in an open turret on the better-protected M10 chassis. (Photo12/UIG/Getty Images)

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INDEX

References to illustrations are shown in **bold**.

Abrams, Lt. Col. Creighton W. 49, 63, 67
antitank forces/towed guns: (Ger) 10, 20, 42, 71; (US) 19, 20, 23, 32, **48**, 56, 74, 75, 77
Ardennes Offensive **31**, 38, 41, 49, 53, 56, 67, **67**, 71, 71, 73, 74–75, 77
armies (Ger): 1. 55; 7. 48; 8. 47
armies (US): First 24, **24**, 38; Third 4, 5, 7, 9, 24, 38, 40, 41, 53, 59, 67, 70, 71
armored divisions (US) 48, 49, 54, 77: 1st 19, 50; 2d **40**; 4th 5, 6, 7, 9, 40, 41, 42, 43, 48, 49, 50, 52, 53, 54, 58, 59, 62, 63, 64, 66, 67, 70, 71, 75; 6th 22, 53, 62; 7th 49; 12th **49**
army groups (Ger): Heeresgruppe G 40, 64, 66
army groups (US) 37: 6th 37, 38, 40, 56; 12th 37, 38

Befehlspanzer command tank 18, 73
Bergpanther recovery vehicle 18
Blaskowitz, GenOb Johannes 40, 62, 64, 66
Bruce, Maj. Gen. Andrew D. 19, 21, 22, 75, 76

Clarke, Col. Bruce C. 49, 53, 62, 63, 64, 66
corps (US): XII 22, 38, 40; XV 38, 56; XX 38, 40, 55

Eastern Front, operations on 5, 6, 8, 9, 10, 13, 14, **14**, 15, **15**, 19, 22, **26**, 37, 41, 42, 43, 47, 56, 66, 73, 74
Eddy, Maj. Gen. Manton S. 38, 40

Flakpanzer SPAAG 44, 56
France, operations in **39**: Arracourt 5, 6, 9, 22, 36, 41, **43**, 47, 48–49, 53, 59, 62, 63–64, **65**, 66–67, **68–69**, 71, 75; Brest **22**, **36**, 53; Brittany 9, 36, 48, 53; Darney 57; Dompaire 9, 44, 56–58, **57**, **58**; Juvelize 47, 66–67; Lezey 63, 66; Lorraine 5, 35, 70, 74, 75; Lunéville 9, 22, 47, 53, 59, **59**, 62, 63, 71; Mairy 9, 44, 56, **66**; Metz 38, 55, 77; Nancy 38, 40, 58; Normandy 9, **16**, **18**, 22, 23, 24, **27**, 35, 37–38, **38**, **40**, 41, 41, **44**, **45**, 53; Rhône Valley 37, 38, 40, 56; Saint-Malo 7, **21**; Troyes 53; Vosges Offensive 9, 38, 41, 44, 44, 55–56, 57–59, 62–64, **62**, **65**, 66, **66**, 67, **67**, 70–72, 75, 75
French forces 9, 20, 44, 57, 57–58

Germany, operations in 4, 4, **24**, **32**, **48**, 53, 74
Rhine, advance to 5, 9, 38, 40, 62, 64
Guderian, GenOb Heinz 8, 10, 14, 42, 43, 45

Haislip, Maj. Gen. Wade H. 38, 40, 56

Italy, operations in 6, 9, 22–23, 24, 37, **52**, 74, 75, 77

Jagdpanther tank destroyer 18
Jagdpanzer IV tank destroyer 44

M3/M6 tank destroyers 9, 20, 48, 53, 57
M4 medium tank 5, 8, 9, **13**, 19, 20, 27, 32, 33, **38**, 48, 56, 57, 58, 59, 64, 66, 70, 72
M5A1 light tank 48, 59, 66, 70, 72
M8 armored car 22, **27**, 34, 49–50
M10 tank destroyer 8, 9, 19, 20, 22, 23, 24, **32**, **40**, 49, 50, 56, 57–58, 75, 77
M18 76mm GMC “Hellcat” tank destroyer
armament/firepower 4, 7, **23**, 24, 26, 30, 31, **31**, **32**, 34, 36, 54, 63, 66, 75, **76**; ammunition 22,

30–32, **30**, 34, 36, 53, 54, 58, 63, **63**; machine gun 22, 24, 32, **48**, **49**, 50, 53, 54, 59, **63**, 64
armor 4, 7, 24, 26, 34–35, 36, 74, 76
crews 7, 24, 31, 32, 35, 36, 52, **52**, **54**, **54**, **59**, 62, 63–64, 70, 72, 76, **76**; training 19, 50–52, 53, 54
design/development/features 6, 8, 9, 19–22, **23**, 24, **25**, 31, 32, 34, 36, 53, 54; engine 24, 36; performance 5, 6–7, 24, 26, 30, 36; running gear/suspension 31, **36**, **49**; shortcomings/vulnerabilities 24, 26, 31, 32, 34–35, 36, 54, 74, 75, 76, 77; sights 32, 54, **61**; silhouette 31, **36**, 38, **51**; turret **29**, 32, 34, 35, 36, **49**, **63**, 74, 75; upgrades 75–76
production 9, 31, 36, 75–76, 77
service 4, 4, 6, 7, 9, **21**, **22**, 24, 24, 30–32, **31**, **32**, **34**, **36**, **36**, 38, 48, 49, 50, 53, 54, **54**, 56, 58, 59, 59, 62, 63–64, 66, 70, 71, 71, 72, 74–75, **76**; kills 7, 9, 53, 62, 63, 64, 71, 72, 74; losses 7, 9, 63–64, 71, **71**, 74; effectiveness 26, 31, 72, 74; postwar users 55, 77; roles 4, **21**, **22**, 26, 32, **32**, **34**, **54**, **59**, 71, 74, 75, 76; tactics 30–32, 33, 51–52, **51**, 72

M20 armored car 49, 50, 71
M32 tank recovery vehicle 50
M36 tank destroyer 75, 77, 77
M38/M39 utility vehicles 22, 23, 75, 77
Manteuffel, Gen. Hasso von 38, 40, 41, 42, 43, 47, 47, 59, 62, 63, 66, 67, 71
McNair, Lt. Gen. Lesley J. 9, 21, 23
medium-tank companies (US) 48, 77

Netherlands, operations in 38, 41, 44, 55
North Africa, operations in 8, 9, **19**, 20, 22

Pacific theater, operations in **54**, 74, 75, 76
Panther Commission 8, 10–11, 12
Panzer armies: 2. 8; 5. 5, 38, 40, 41, 42, 47, 59, 62, 64, 66, 67, 70

Panzer battalions 9, 12, 44, 45, 56, 57, 58, **62**: PzAbt 2106 56; PzAbt 2111 44

Panzer brigades 4, 5, 7, 9, 40, 41, 42–44, 46, 47, 55, 56–57, 58, 62, 66, 70, 72, 73: 101–105. 42, 43, 74; 106. 9, **16**, 41, 44, 55–56, 57, **66**, 71, 74; 107/108. 41, 42, 43, 44, 74; 109/110. 42, 43, 74; 111. 9, 35, 41, 43–44, **43**, 46, 47, 59, 62, 63, 64, 66, 67, **67**, 71, 72, 74, **75**; 112. 9, 41, 43–44, 56–57, **57**, 58, **58**, 71, 74; 113. 9, 35, 41, 43, 44, 46, 47, 59, 62, **62**, 63, 64, 66, 71, 72, 74; Bäke 42

Panzer corps: XLVII./LVIII. 38, 41, 59

Panzer divisions 6, 8, 10, 15, 19, 20, 41, 42, 43, 45, 46, 57, 70, 73: 2 SS *Das Reich* **27**; 4. 10; 5. 47, 74; 5 SS *Wiking* **15**; 6. 47; 7. 74; 11. 40, 71, 74; 12. 57, 71; 13. 74; 16. 44; 20. 74; 21. 40, 58, 59, 74; 25. 74; 116./Feldherrnhalle 74; Lehr **18**, 44

Panzer regiments: 16. 44; 29. 57, 58; 33. **16**; 130. **44**, 62

Panzerjäger IV/70(V) tank destroyer 56

Patton, Lt. Gen. George S. 4, 5, 7, 9, 24, 38, 40, 41, 44, 53, 56, 62, 64, 70

PzKpfw III medium tank 6, 10, 15, 22, 45

PzKpfw IV medium tank 6, 9, 10, 11, 12, 15, 22, 44, 58, 62, 63, 66, 71, 72: battalions 12, 15, 43, 44, 57; losses 9, **41**, 63, 64, 70, 71, 72
PzKpfw V Panther medium tank

armament/firepower 5, 6, 7, 12, **14**, **17**, 26, 27, 30, 33, **45**, 56, 58, 72, 73, 74; ammunition 16, 18, 27, 27, 30, 33, 34, 45; machine guns 15, 16, 17, 18, 27

armor 5, 5, 6, 7, 8, 12, 13, 14, 15, 26, 30, 31, 33–34, **33**, 35, 36, **40**, **56**, 62, 64, 72, 74, 77: *Schürzen* 5, 6, **11**, 33–34, **40**, **45**, **67**, **75**
crews 14–15, 16, 27, 30, 33, 34, 36, 45, **46**, 72: training 42, 44, 45–47, 57, 73

design/development/features 6, 8, 9, 10–11, **11**, 12, 13, 14–16, **17**, 27, 33, 34, 35, **45**, 73; engine 8, 12, 13, 14, 16, 35; performance 5, 12, **13**, 14, 16, 26, 35, 73; prototypes (VK30.02) 11–12, **11**, 14; running gear/suspension 12, **12**, 13, 15, 35; sights 14, 16, 27, 30, **60**; turret 13, 14, 15, **28**
production 6, 8, 9, 11, 12, **12**, 13, 14, 15, 16, 26, 35, 57, 73–74: shortcomings/vulnerabilities 6, 8, 9, 11, 13, 14, 15, 26, **26**, 30, 33, **33**, 34, 35, 36, 44, 56, 57, 58, 62, 64, 71, 72, 73, 74

service 4, 5, 6, **6**, 7, 8, 9, **11**, 12, 13, **13**, 14, **14**, 15, **15**, 19, 22, 26, **26**, 27, 30, 31, **33**, **33**, 34, 35, 36, **40**, 41, 42, 44, 45, **45**, 46, 55, 56, 57, 58, 59, 62, 63, 64, 66, 71, 72, 73, 75: kills 7, 14, 42; losses 7, 9, 14, **16**, **18**, **27**, 35, **40**, **41**, 44, 56, 57–58, **57**, **58**, 62, **62**, 65, 66, **66**, 67, 70, 71, 72, 73, 74: Panther battalions 4, 9, 12, 14, 15, 42, 43, 44, 45, 46, 57; effectiveness 27, 30, 72, 73; engagement ranges 20, 27, 30, 33, 34, 36, 58; postwar legacy/users 74, 77; transport/recovery of 18, **26**, 35, **35**, 57

variants: Ausf A 9, 12, 14–15, **15**, **16**, 33, **45**, 73; Ausf D 8, 9, 13, **13**, 14, 14, 15, 33, 35, 73; Ausf G 9, 15–16, **17**, **18**, **26**, 27, 27, 30, 33, 34, 35, **43**, **45**, **57**, **67**, 73–74, **75**

PzKpfw V Panther II tank 14

PzKpfw VI Tiger I heavy tank 5, 6, 11, 18, 22, 27, 33, 38, 42, 77

Schellendorf, GenMaj H.-W. 47, 67

Seckendorff, GenMaj E. 44, 47, 67

StuG III/IV assault guns 37, 44, 57, 70, 71

T-34 medium tank 6, 8, 10, 11, 12, 13, 19, 27, 33, 45

T41/T41E1 utility vehicles 75–76, 77

T42/T49/T67 tank destroyers 8–9, 20–21

T70 tank destroyer 9, 21, 22, 53, 72

tank battalions (US) 48, 49, 64, 77: 37th 47, 49, 63, 64, 66, 67; 712th 56

Tank Destroyer Center 6, 8, 9, 19, 20–21, 22, 23, 50, 51, 52, 53, 75

Tank Destroyer Command 8, 19, 20

Tank Destroyer Tactical and Firing Center 8, 19

tank-destroyer battalions (US) 4, 6, 9, 19, **19**, 20,

22–23, 24, 48, 49, 50–52, 53, 54, **54**, 56, 71, 74, 75, 76: 602d 66; 603d 7, **22**, 24, 53, 59, 62; 607th 56; 628th 50; 637th **54**, 75; 704th 7, 9, 24, 49, 50, 51, 52, 53, 54, 59, 62, 63–64, 66, 70, 71–72, 75, **76**; 705th 7, **21**, 24, 75; 805th **52**, 75; 823d **48**; 824th **32**; 827th **49**; 849th 24

tank-destroyer battalions (towed) 24, 49, 71, 77

tank-destroyer companies 5, 49, 50, 51, 53, 54, 59, 62, 63–64, 66

Walker, Maj. Gen. Walton H. 38, 55

Wood, Maj. Gen. John S. 40, 41, 48–49, 62, 64

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Editor's note

All measurements of the angle of armor in this book are expressed in degrees from vertical.

Title-page photograph: An M18 of the 894th Tank Destroyer Battalion, Anzio, May 1944. (NARA)